RAILROAD GAZETTE

FRIDAY, OCT. 25.

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Contributions.

Fair Treatment of Damage Claimants.

PHILADELPHIA, Oct. 7, 1889.

TO THE EDITOR OF THE RAILROAD GAZETTE:

As in your remarks following the publication of my letter of Sept. 17, in reply to "Merchant," relative to freight claims, you ask me a question. I presume you desire a reply; and first allow me to say that while I did not state claimants' papers are returned *only* on demand, the custom really amounts to this. Like all customs, however, it has a reason, and it is not discourtesy to or arbitrary treatment of the claimant. It is often found that when claims are declined upon the investigation, the claimants are able to throw further light upon them, causing favorable re-consideration, and experience has taught that it is desirable to keep the papers together rather than have the originals sent backward and forward through the mails. As I have said, when claimants desire the return of the papers they have furnished, they have but to ask ("demand" is too strong a word) for them and they are at once returned, even to the bill of lading or receipt, although I do not in any measure retract what I said in respect to this document belonging to the delivering road, the contract for which it was issued having been completed. While it is perfectly true that in a court of law the delivery of goods can be proved in other ways than by the production of the receipt, I think no one will argue that such receipt being produced is not the simplest way of showing it. If I, in my individual capacity, give a receipt to a man for, say, a chest of silverware that he deposits with me for safe keeping, I naturally desire, when it is called for, to take up the receipt before delivering it, although as you justly say, I could prove the delivery in other ways; but taking up the receipt is by far the simplest.

The law in Pennsylvania requires the carrier to take up the bill of lading, imposing severe penalties in default thereof, exception being made when such document is stamped "not negotiable," and similar laws exist in most other states; and while, as you say, the commercial world is settling down to the theory that the bill of lading passes title to the property only when it represents an "order" consignment, still the law is there, and how can it be known whether the bill of lading contains the relieving clause "not negotiable" until it is examined?

And while the Trunk Line Association has endeavored, and I think, successfully, to cover this point, how many lines does the Association embrace compared with the railroads of the country? The delivering line is called upon to complete a contract made by a road more likely than not outside of the Association. If you could look over a file of the bills of lading of the average railroad company, such as I have before me, I think you would admit the advisability, as a matter of simple business precaution, of asking for these receipts when settling claims, bearing in mind that when subsequently wanted by claimants for any purpose they are returned after being stamped "accomplished."

CLAIM AGENT.

[It is, indeed, a "simple business precaution" to take all the precautions one can, and the law that a negotiable bill of lading must be taken up when its stipulations have been carried out may not be unreasonable; but in the case of a claim the other party is generally of the opinion that the carrier has *not* fulfilled its part of the agreement in all particulars. Our contention is that it is good policy to take more pains to recognize this feeling, notwithstanding the fact that it is often found to rest on poor grounds, legally. Humoring the other party's whims is a large element of success in business. The exasperation of the man who has a two-dollar claim at Turtle Creek, and who has to submit to sundry convolutions of red tape between that place and Philadelphia to get his money, may harm the company enough to pay an additional claim clerk's wages for several weeks. It is true that diplomats and lawyers cannot be employed as agents at small stations, but the asperities of the relations of the roads to the public may be much softened by more intelligent tact and less reliance on machine methods. This is true in most departments, but is especially true in the claim department. The trouble lies largely in lack of a sufficient clerical force. Our correspondent must know that this cause, for which he, individually, is but remotely responsible, is the source of much of the friction constantly observable, and he should not try, by argument about details, to support a position which could so easily be placed beyond the need of such support.—EDITOR RAILROAD GAZETTE.]

Counterbalancing Locomotives.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Referring to Mr. Booth's letter on locomotive balancing, published in your issue of Oct. 11, "As regards C.'s objections," he says, "on the score of the coupling rods: In the first place, high-speed locomotives do not require coupling rods; they have all the adhesion they want or can utilize when running at speed." It was presupposed, of course, that the question was viewed from an American standpoint, as applied to what is generally accepted as good practice in this country.

The many failures of single-driver locomotives built without coupling rods, to haul express trains at all satisfactorily and compete with the usual eight-wheel American type of engine, are too well known to those familiar with railroad practice to need much further comment. A few moments' thought, however, will show that an engine having but one pair of driving wheels cannot exert sufficient power, from lack of adhesion, to handle trains of even ordinary weight. Twenty thousand pounds per wheel, or 40,000 lbs. per pair, is now, even by those most indifferent to the economical wear of the rails and the maintenance of the track, considered the utmost which steel rails of ordinary weight should be required to bear. The measure of a locomotive's power or tractive force is its adhesion, which is in direct proportion to the weight borne by the driving wheels and the weight of the drivers themselves resting on the top of the rails; provided, however, the cylinders and boiler are of suitable proportions.

It is evident the tractive force should not exceed the adhesion, otherwise the engine will slip. A well-designed eight-wheel engine, having 40,000 lbs. on the drivers and a total weight of about 60,000 to 65,000 lbs., would therefore have about the same power as the heaviest single-driver engine it would be expedient to build. An engine of this weight would be totally inadequate to haul a heavy express train at 50 or 60 miles per hour under the conditions existing in this country. Coupling rods may therefore be regarded as a necessity on passenger locomotives, whose use, from indications regarding the favor in which 10-wheel engines for hauling fast trains are regarded, is more likely to extend than diminish until the invention and development of something better is an assured fact.

The use of compound and other multiple cylinder engines in this country is still in its infancy, and until their capacity and power are thoroughly tested, the express and other trains will have to be hauled by engines which possess the necessary amount of adhesion, and where driving wheels are revolved by means of coupling rods. Nothing has been invented or developed as yet which is so simple, reliable or so effective for utilizing the adhesion of more than one pair of wheels in the ordinary type of locomotive as the coupling rod, with the crank pins set at 90 degrees to each other.

Regarding the balancing of the coupling rod, to which Mr. Booth refers, I was not aware that there was any question as to its being anything other than a revolving weight, and capable of being perfectly balanced for all speeds as such. The elements of discord in perfect counterbalancing are the reciprocating parts, and in steadiness of onward movement and tendency to revolve the entire mass of the engine around a vertical axis is largely due to the want of uniformity in the turning moment applied to the driving wheels. The perfectly balanced engine or motor for railroads, which would not contain in itself any disturbing forces to its perfect evenness and smoothness of motion, at all speeds, would evidently be one in which there were no reciprocating parts, the turning force being uniform during the entire revolution, and applied either centrally between the drivers or with equal force on both sides. These conditions are impracticable in the use of steam as a motive power, and could only exist perfectly in some arrangement similar to an electric motor. Of course in the case of inside connected engines it is clearly evident that the cranks can be opposite, and the crank pins and coupling rods placed at 90 degrees from each other, without affecting the rods, provided there was no objection to the very unequal turning moments and the use of means of getting off the dead centres. Carrying the rod on one side on an arm from the crank pins, in the case of an outside-connected engine, would be a doubtful arrangement, viewed from a strictly mechanical standpoint, and, although in use on the continent, where some remarkable contrivances are sometimes indulged in, would undoubtedly provoke much unfavorable criticism in this country.

Your editorial in the same issue speaks of the great difference in size and weight of the reciprocating parts in locomotives of approximately the same size. In the present state of the art of locomotive building more can be done at once to remedy the evil of unbalanced driving wheels in this direction than anywhere else. A great deal of unnecessary metal is usually contained in these parts, and when it is remembered that every pound of weight in the reciprocating parts is nearly doubled on account of the counterbalance usually added to the wheels to insure smooth and even motion, causing more and more vertical unbalanced force in the drivers as the weight increases, the advantages gained from keeping these parts as light as possible are apparent; not only is any unnecessary weight over and above that which good designing, together with the use of the best and most suitable materials, bad mechanical practice, and a waste of metal which could be better applied elsewhere, but a positive hindrance to the working of the engine at high speeds, and the maintenance of the bridges and track.

Several methods of lightening the reciprocating parts suggest themselves, which are not new, untried or experimental, among which may be mentioned the following: The main rod can be made of steel, I section, milled, or forged out, with a thin web and deep section, properly proportioned according to its length and the diameter of the cylinders, so as to combine the greatest strength with a minimum weight. The crosshead could be of special design, made of cast steel, cored out where practicable into thin box sections and provided with wearing surfaces of brass or other metal, which would insure good wearing surfaces. The cored-out cheese-box section of piston head, with its accompanying straight, or nearly straight, form of cylinder heads, could be abandoned, and a plain cast-steel piston head with an inclined central web and broad, thin ring on circumference carrying the packing rings used, also forming the portion of the cylinder head which enters the bore of the cylinder, to project inward and conform to the shape of piston heads.

Decreasing the weight of the piston rod, while it would be more experimental and costly than the foregoing, could be accomplished by increasing the diameter and making it hollow of heavy pipe of ¼ in. or ⅜ in. thick, with a solid crosshead and carefully welded in, the fit in piston head not much reduced in size, riveted over or provided with nut to hold it securely, and a plug screwed into the open end. It is apparent from the dimensions of various types of engines built in different shops throughout the country that but little attention has hitherto been paid to this subject. A slight investigation will convince any one who is at all skeptical how much lighter these parts can be made without the sacrifice of strength and at not much additional cost.

"C."

The Standard Code on the Pennsylvania.

The revised Book of Rules of the Pennsylvania Railroad Company has been issued, to take effect Oct. 31, 1889. Promptly after the adoption of the standard code by the General Time Convention, the work of revision of this book was placed in the hands of a committee of officers, who have devoted to it much time and labor, the results having been carefully gone over by others whose positions in the service render them specially competent to pass upon the practical questions involved, as well as by the higher officials of the company. The issue of the book has been delayed by the time necessarily occupied in the process of revision, and by the other calls upon those engaged in it, especially those arising from the damage to the road by the floods of the present year. The train and the telegraph rules are in one book, which also contains rules relating to the operation of the block system and the special duties of different classes of employés.

The rules adopted by the Time Convention were submitted to the most careful scrutiny, with reference to their entire construction, as well as their adaptibility to the particular service of this road, and there has been no departure from the principles laid down in those rules, nor from the general arrangement. Some changes occur in the phraseology, designed evidently to secure greater precision of expression.

The rule respecting the examination of watches provides that this shall be by "an inspector appointed by the company," who may, of course, be a "watchmaker," or some other competent person. The certificate form is not printed in the book. In rule 21, the method adopted of indicating on the time-table the trains that a given train is to meet or pass is by printing their numbers in small type in the schedule column near the full-faced type. Rules 101 and 102 are so changed as to make them apply to trains as respects their "class" relations, instead of as "freight" and "passenger." In the choice of methods left optional the Pennsylvania retains the signature of the engineman to the "31" order. The "19" order is adopted, subject, it is presumed, to special regulations as to the circumstances under which it shall be used. The normal position of the train order signal is at danger, and rule 524, B, is therefore omitted. The block signal rules, which are not included in the standard code, have been revised, and are much more complete than formerly. All the important principles of the former rules are preserved, and several valuable features are added. The special rules for classes of employés appear in new form, a single number covering the provisions for each class, and considerable matter deemed unnecessary or obsolete has been left out.

Excepting typographical corrections, or changes in punctuation and use of capital letters, the following list shows the points in which the train and telegraph rules differ from the Standard Code as adopted by the Time Convention, including those above mentioned:

General Notice. The language is somewhat modified, and the portion covered by rule 6 is omitted. The tone indicating that the writer puts himself on a level with the employé

is changed, and the language is more nearly that of a master addressing a servant.

Rule 4. Omits "of this company" after "employé."

Rule 13. The hour for transmitting time is fixed at 2 P. M., Eastern time. It comes from Allegheny observatory.

Rule 15. Omits "and enginemen." So elsewhere where enginemen are not specially referred to, the enginemen being included in "trainmen."

Rule 16. For "the form attached hereto" is substituted "the prescribed form," and the form of certificate of watch inspector is not printed in the book. For "a responsible watchmaker" is substituted "an inspector appointed by the company."

Rule 17. Puts "each daily run or trip" for "each trip," and "on a form" for "on a blank form (or in a book)."

Rule 19. Puts "are" for "is" in last sentence.

Rule 21. For the fourth paragraph, "The numbers of trains that are to meet or pass are shown in small type adjoining the full-faced type."

Rule 22. Omits part in parenthesis after "'s,' regular stop."

Rule 23. Omits "switchtenders;", and elsewhere where it occurs "switchmen" is substituted.

Rule 30. Omits "immediately" in two places.

Rule 31. Omits "come to a" before "stop."

Rule 37. Omits last sentence, "These signals, etc."

Rule 45. Omits second flagman signal, leaving it for special regulations, and makes the one signal applicable to all directions.

Rule 48. Provides that the signal shall be given only by passenger trains.

Rule 51. Title is changed to "Whistle-Cord Signals," and for "tap of the signal bell," in this and following rules to 57, inclusive, is "blast (or blasts) of the signal whistle."

Rule 58. Omits "than bell-cords and signal bells."

Rule 65. In title omits, "Rules Governing the."

Rule 67. Reads "except in cases of danger" instead of "except in cases of emergency or danger, or when required by the rules."

Rule 79. Omits title "Train Rules." After "Extra trains are those not represented on the time-table," is added "and may be run without notice."

Rule 81. Omits "or Special" after "Passenger Extra."

Rule 84. Puts "on the time-table" for "in time-table."

Rule 90. For "(which may be shown on the margin of the time-table)" is substituted "as shown on the time-table, on the margin or otherwise."

Rule 91. This is followed by:

91*a*. On a passing siding to be used by trains in either direction, trains must run expecting to meet opposing trains, and at a speed not exceeding six miles per hour, and must not pass the centre except under the protection of a danger signal, kept at least 600 yards in advance.

When trains meet on a siding, the train nearest the switch must be backed, under the protection of a danger signal kept at least 600 yards in advance, in the direction in which the train is moving. Where there are crossing switches they must be used, when the backing of either train from the siding on to the main track can be avoided.

The centre of a siding is indicated by the position of the telegraph station, or a designating post.

The use of long sidings used partly as running tracks will be regulated by special rules.

Rule 96. Has "a time table stop" for "any of its usual stops," and "other" for "unusual" point. The blanks are filled by "three" minutes "900 yards" and "one" minute.

Rule 97. Reads "When a freight train stops where the rear, etc." Omits "or if it stops at any point that is not its usual stopping place." Fills distance blanks by "900 yards," "100 yards," "900 yards" and "900 yards." Puts "*five*" instead of "*ten*" minutes in latter part of first paragraph.

Rule 98. Puts "baggageman" for "baggage master," conforming to title in rules for employés.

Rule 99. Fills blanks by "600 yards," "1,200 yards" and "900 yards," and, before the second, the words "at least" are preceded by "to a point." "Where he must remain" is substituted for "and he must remain there." Puts "*five*" instead of "*ten*" minutes.

Rule 100. Fills blank by "1,200 yards."

Rules 101 and 102. Designate trains as of "superior" and "inferior" class, instead of "passenger" and "freight," the language being modified accordingly. They read as follows:

101. When a train on double track turns out on to the opposite track to allow a train of superior class running in the same direction to pass, and, while waiting, a train of superior class from the opposite direction arrives, the train of inferior class may cross back and allow it to pass, provided the other train of superior class is not in sight; and also provided that a flagman has been sent with danger signals, as provided in Rule No. 99, not less than 1,200 yards in the direction of the expected train.

102. When it is necessary for a train on double track to turn out on to the opposite track, to allow a train of superior class running in the same direction to pass, and a train of superior class running in the opposite direction is due, a flagman must be sent back with danger signals, as provided in Rule No. 99, not less than 1,200 yards in the direction of the following train, and the train of inferior class must not cross over until one of the trains of superior class arrives. Should the following train of superior class arrive first, a flagman must be sent forward on the opposite track with danger signals, as provided in Rule No. 99, not less than 1,200 yards in the direction of the overdue train of superior class, before crossing over. Great caution must be used, and good judgment is required, to prevent detention to either train of superior class. The preference should always be given to the train having superior right.

Rule 103. Fills blank by "600 yards in advance."

Rule 106. Inserts "thereby," so as to read "does not thereby lose its rights."

Rule 108. Inserts "thus" before "passing" in the last paragraph.

Rule 110. Reads as follows:

110. Signals carried by a train for a following train will be displayed or removed on order from the Superintendent. Yard Masters are authorized to give such orders for freight trains.

Rule 111. Puts "orders" for "an order."

Rule 114. Reads as follows: "A train approaching a station where a passenger train is receiving or discharging passengers must be stopped before reaching the passenger train."

Rule 117. Inserts "and flagmen" after "conductors." Puts "the" trainmen for "their" trainmen. Omits second paragraph.

Rule 509. Conforms to suggestion in first note of Time Convention rules, and requires signature of engineman to train orders, making the necessary changes. Omits "office" before "signal" in last line of first paragraph and in Rules 511 and 513.

Rule 510. Inserts "engineman and pilot" after "conductor." Puts "telegraph" for "line" here and in Rule 512.

Rule 513. Puts "the signatures they" for "the signature of a conductor it."

Rule 514. Puts "in the places" for "for which places are."

Rule 518. Reads "When necessary to give orders, etc." Inserts "they" before "must be delivered."

Rule 519. In the form of address, after "(*at* ——)," adds or "(*between* —— *and* ——)." Adds to the first paragraph "and forward it immediately to the Superintendent."

Rule 523. After "regular train," instead of "which," inserts "are to be considered as annulled when the train,' and "are annulled" in the next line is omitted.

Rule 524 (A). Reads "524. Except where trains are governed by block signals, a fixed signal, etc." In second paragraph, omits "come to a full" before "stop;" inserts "the whole of" before "a train;" and transfers "only" in third sentence to come after "white." In third paragraph, puts "nearly vertical" for "in an inclined position."

Rule 524 (B). Omitted.

Rule 526. Inserts "first No. 10" after "No. 10" and "will' be designated" before "by figures."

Rule 527. Omits "and stations" in last line.

Train Order Forms.—Forms C and E omit the note following title.

Form G. Retains only the first form, and modifies the language so as to describe the train as an extra instead of special, and instead of "Example (1) may be varied, etc.," says, "The order may be varied, etc."

Form H. In paragraph (c) changes arrangement of names to conform with (b). In paragraph (f) omits "in the manner provided in Rule 99."

Form L. In the last line of the notes below the example, "first received" is substituted for "first given."

Train Order Blanks.—These forms are given at the close of the book, the specifications being on the back of each. The form of address is changed to read "*To* C. & E. *of* No. 13 *at* station." In the specifications the second paragraph is omitted.

The notes and recommendations of the Time Convention committee are, of course, not printed with the rules.

RULES BETWEEN 121 AND 500.

Following the last general rule in the standard code (No. 121) are the rules governing the block system, which are numbered 201 to 216, inclusive. A caution signal "indicates that there are one or more trains in the block and is permission to proceed, with this knowledge." To indicate caution, the semaphore is held by the operator inclined midway between danger and all clear. When showing all clear, also, the signal must be held by the hand and not fastened. A train must not be reported to the station in the rear as having passed until its rear end has got 300 ft. beyond the signal. The rules make no provision for distant signals at block stations, so that in case of fog or other obscuration fast trains must be slackened. Permissive blocking is never allowed in the case of a train following a passenger train. Passenger trains are allowed to follow other trains under a caution signal when the preceding train has had time to reach a cross-over or siding. When a train has occasion to cross over between block stations the conductor must have the operators at both ends display green, each for his respective track. The other block signal rules show no marked peculiarity.

The 26 rules, from 217 to 242, inclusive, are each for a single class of employés, giving, in concise language, the instructions applicable to each. The old Pennsylvania code was carefully compiled in this respect, and the present issue is a further condensation, making the paragraphs very compact. In fact, in numerous instances, it is to be observed that accuracy has been sacrificed to brevity. The rules for conductors and for some other classes repeat some of the things embodied in the standard code.

The 26 classes covered are train dispatchers, station masters, passenger conductors, passenger brakemen, baggagemen, yard masters, freight conductors, freight brakemen, station agents, baggage agents, division operators, telegraph operators, telegraph repairmen, road foremen of engines, enginemen, firemen, master mechanics and general foremen of car shops, engine-house foremen, shop clerks, foremen of car inspectors, supervisors, master carpenters, track foremen, road and bridge watchmen and switchmen.

"Station masters" have charge of large passenger stations; the man in charge at ordinary stations is a "station agent." "Baggagemen" work on trains and "baggage agents" are located at stations.

We give a few extracts from these rules. Passenger brakemen in calling out the name of a flag station must say "flag station." An assisting engine at the rear is part of the train it pushes. Conductors are told to report misconduct and negligence, while station agents must report the same *to the superintendent*. There is no requirement that station agents shall see that switches are right before the arrival of trains. Telegraph operators are under the division operator, but those located at stations must obey the agent if his orders do not conflict with their duties. They have to look for markers on the rear of every train, and this seems to be required of all operators, whether in charge of a block signal station or not. Firemen are required to examine the bulletin at the beginning and end of each trip the same as enginemen. Supervisors (division roadmasters) are required to be familiar with the train service and to report violations of rules in that department. They are directed to "discipline" their men for neglect of duty, but in train and station service this specific requirement does not appear. Switchmen are under the supervisors, except in yards, where they are under the yardmaster. Track foremen must "engage in work personally," and the only special provision for stormy weather is that they "must detail all hands to watch the road and take every precaution to prevent accident." Hand cars must keep 20 minutes off the time of regular trains, must not be run in the wrong direction on double track, must not be run after dark, and not be attached to trains in motion.

Two New Express Locomotives.

An interesting competitive trial of two locomotives has been for some time in progress on the Chicago, Milwaukee & St. Paul. These locomotives were built, one by the Schenectady Locomotive Works and the other by the Rhode Island Locomotive Works, for passenger service between Chicago and Milwaukee. The service required of these engines is to haul 15 cars a distance of 85 miles in 2½ hours. In this distance 10 stops are made, and the speed must be low in the suburbs of Chicago and Milwaukee. The designs of the locomotive were entirely left to the builders, the only limitations imposed being such factors as the maximum weight per wheel and others which affect the road-bed. The results obtained with these two locomotives have not yet been made public, but we are able to give illustrations of the engines, and the following extracts from the specifications. The trailing truck on the Schenectady locomotive was introduced owing to the limit of weight on drivers. Prints of the working drawings of the Rhode Island locomotive have not been received, and therefore we are able only to give the general elevation from a photograph. The following is the general description of the two locomotives:

	Schenectady.	Rhode Island.
Gauge	4 ft. 8½ in.	4 ft. 8½ in.
Fuel	Bituminous coal	Bituminous coal
Cylinders	19 in. × 24 in.	19 in. × 24 in.
Drivers, diameter	69 in.	64 in.
Driving wheel base	12 ft. 6 in.	14 ft. 8 in.
Total wheel base	27 ft. 10 in.	24 ft. 11 in.
Weight, in working order, on drivers	88,000 lbs.	85,700 lbs.
Weight, in working order, total	131,000 lbs.	113,500 lbs.
Weight on truck	.....	27,800 lbs.
Weight of tender	.....	65,000 lbs.
Tank capacity	.....	3,600 gals.

SPECIFICATIONS OF SCHENECTADY LOCOMOTIVE.

Boiler to be capable of carrying with safety a working pressure of 165 lbs. per square inch, and of sufficient capacity to supply steam economically. All horizontal seams quadruple riveted, with welt strip inside. A double-riveted seam uniting waist with fire-box. Boiler with extended front end. Waist, dome and outside of fire-box of steel, ½ in. thick. Diameter of waist at front end, 56 in., made wagon top, with one dome 30 in. diameter placed on wagon top.

Fire-box of best quality fire-box steel, 102 3-16 in. long, 42¾ in. wide, front 58¼ in., back 55¼ in. deep. Crown sheet ⅝ in., tube sheet ½ in., side and back sheets 5-16 in. thick. Water space, 4 in. front, 3 in. sides, 3 in. back. Crown sheet supported by crown-bars made of two pieces of wrought iron, 5 in. wide, ¾ in. thick, placed not over 4½ inches apart, reaching across crown and resting on edge of side sheets. Crown-bars riveted to crown sheets with ⅞-in. rivets placed not over 1½ in. from centre to centre, each bar having four stay-braces to top of boiler or dome.

Tubes of charcoal iron, 247 in number, 2 in. diam., 12 ft. 6 in. in length; set with copper ferrules at both ends.

Grates—Rocking, with drop plate; ash-pan hopper, with dump plates.

Smoke-Stack taper; deflecting plate and netting in smoke-box.

Frames.—Width of frame, 4 in. throughout.

Pistons made with removable follower, and fitted with approved cast-iron steam packing; piston rods of hammered iron.

Guides of hammered iron, case hardened.

Valves.—Allen-Richardson balanced steam-chest valves.

Heating Surface.—Tubes, 1604.5; fire-box, 140.6; total, 1745.1 sq. ft.; grate area, 30.4 sq. ft.

Crossheads of cast steel, with brass gibs, for Laird guide.

Driving Wheels, six in number, 69 in. diameter, and turned to 63 in. diameter to receive tire of Krupp crucible steel, 3 in. thick, first and third pair flanged, 5¾ in. wide; main pair plain, 6½ in. wide.

Axles of hammered iron, with journals 7½ in. diameter, 8½ in. long. Driving-boxes of cast iron, with heavy brass bearings and large oil-cellars.

Rods—Connecting and parallel rods of steel, each forged solid. Parallel rods with solid ends.

Crank-Pins of hammered iron, case hardened.

Engine Truck, Front, with square wrought-iron frame, cast-iron pedestals and centre-bearing suitable for swinging bolster.

Wheels, Front—Four steel-tired spoke, 30 in. diameter.

Axles of hammered iron, with with inside journals 5½ in. diameter, 9 in. long.

Finish—Boiler lagged with asbestos and jacketed with planished iron; secured by planished iron bands. Dome lagged with asbestos. Cylinders lagged with asbestos and wood, with sheet-iron casing.

Trailing Truck—Two-wheeled swinging bolster swiveling truck, 33 in. steel-tired spoke wheels, journal 5½ in. × 9 in. Truck equalized with drivers, with cross equalization, having side bearings at sides of truck.

Tender.

Frame of 6½ × 4 × ⅝ in. angle iron.

Trucks—Two four-wheeled centre-bearing trucks made with wrought-iron side-bars, cross-beams and bolsters of white oak. Additional side-bearings on both trucks.

Wheels double-plate chilled, of first-class manufacture, of 33 in. diam.

Axles of hammered iron, with outside journals 4 in. diam., 7 in. long. Brake on both trucks.

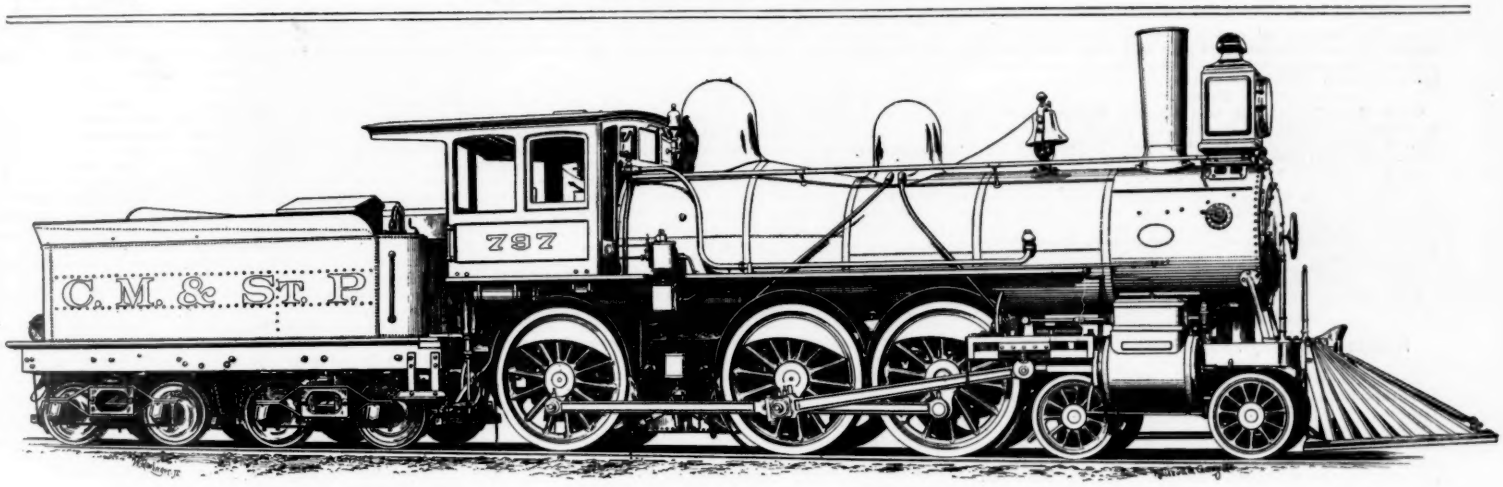
Tank of 3,600 galls. capacity.

Brake.

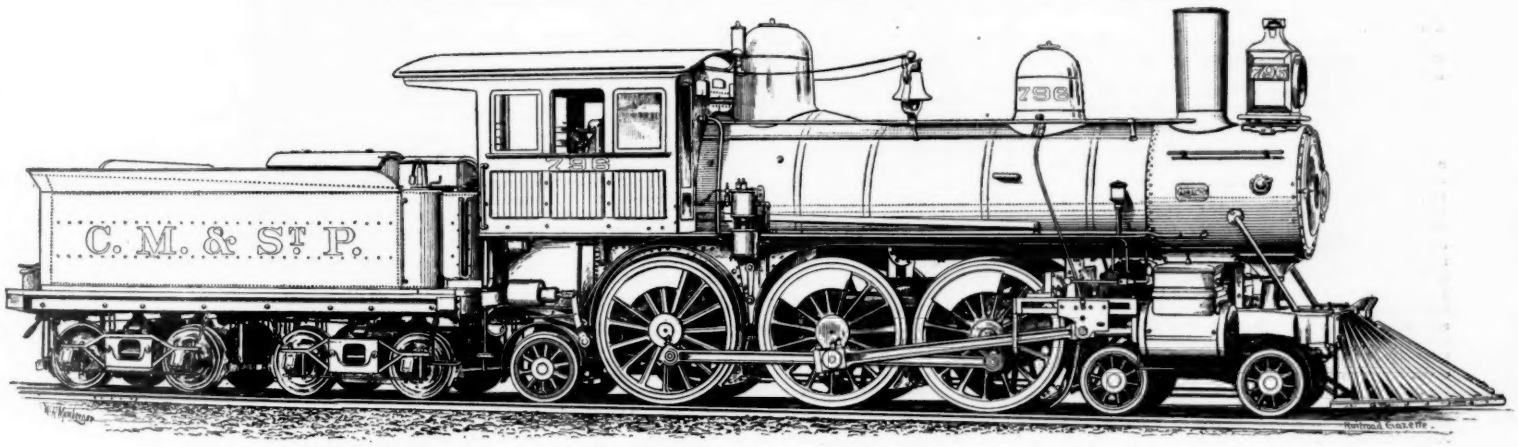
American driver brake on all drivers operated by air. Westinghouse automatic air brake on tender and for train.

SPECIFICATIONS OF RHODE ISLAND LOCOMOTIVE.

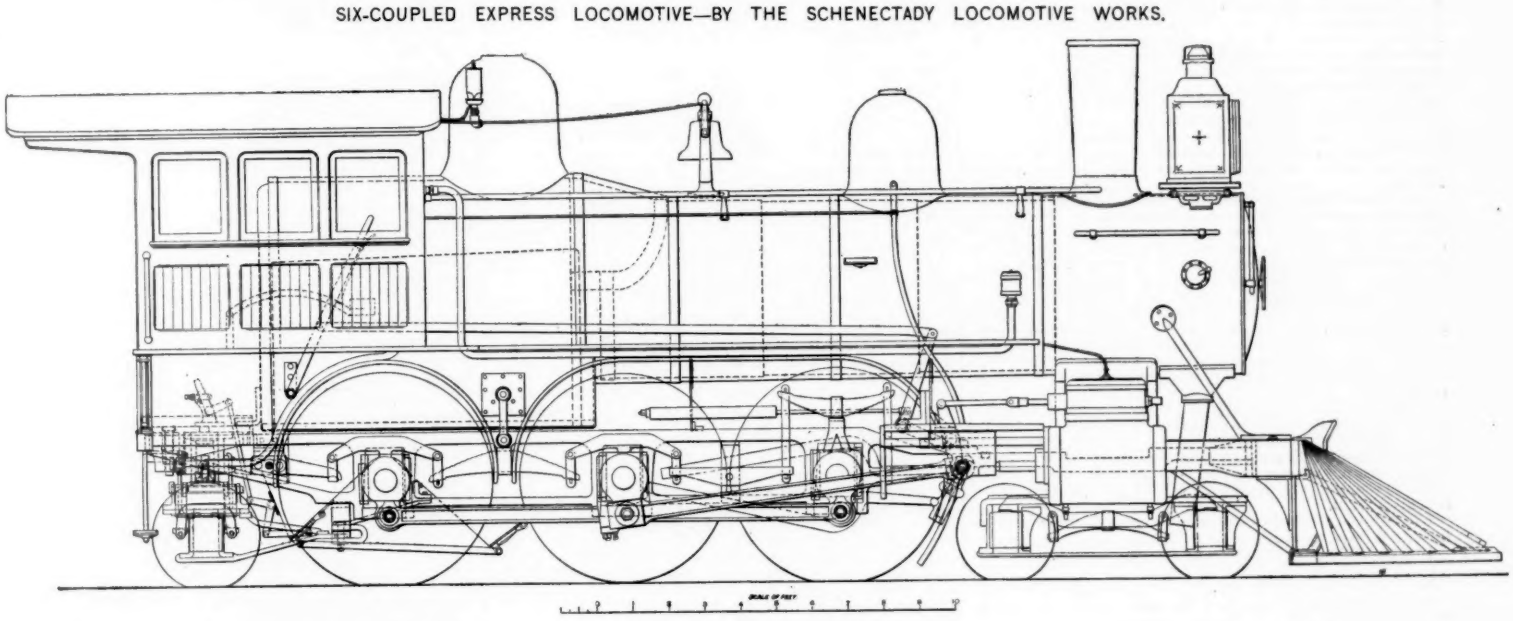
Boiler of Otis steel, 9-16 in. thick; throat, ⅝; riveted with ⅞ in. rivets placed not over 2¼ in. from centre to centre; all circular seams and junction of waist and fire-box double riveted;



SIX-COUPLED EXPRESS LOCOMOTIVE—BY THE RHODE ISLAND LOCOMOTIVE WORKS.



SIX-COUPLED EXPRESS LOCOMOTIVE—BY THE SCHENECTADY LOCOMOTIVE WORKS.



all longitudinal seams provided with butt joints. Boiler tested with 235 lbs. to the square inch, steam pressure. Waist, 56 in. in diameter at smoke-box end, made wagon top, with extension arch, with one dome 30 in. diam., placed on wagon top.

Tubes of charcoal iron, 236 in number, 2 in. outside diameter and 11 ft. 10 in. in length, with copper ferrules on fire-box end.

Fire-box of Otis steel, 78 in. long, and 34⅛ in. wide; side 5-16, and back sheets, ⅜ in. thick; crown sheet, ⅜ in. thick; flue sheet, ½ in. thick. Water space, 3½ in. wide at sides, 3½ in. wide at back and 3½ to 4½ in. wide at front; stay bolts, ⅞ and 1 in. diam., screwed and riveted to sheets, and not over 4¼ in. from centre to centre; drilled telltale above frame. Crown supported by crown bars, each made of two pieces of 5½ × ¾ in. wrought iron, placed not over 4½ centres. Crown-bar bolts, ⅞ diam., with flat heads under the crown sheet, the fit in the crown sheet to be tapered and drawn to its place by a nut above the crown bar. Grates, cast iron, rocking and dump. Ash pan, wrought iron, dampers front and back.

Piston heads and followers of cast iron, fitted with cast-iron spring-ring packing; piston rods of cold rolled steel, keyed to crossheads, forced and riveted to piston.

Guides of cast-iron gun metal.

Crosshead of cast steel, with brass gibs.

Driving wheels, six in number, 64 in. in diameter; centres of cast iron, with hubs and rims cored out and turned to 57 in. diam. to receive tires. Tires of standard steel 3½ in. thick; first and third pairs flanged 5¾ in. wide; second pair, plain, 6½ in. wide.

Axles of Otis steel; journals, 7½ in. diam., and 8 in. long.

Rods—Connecting and parallel rods of Otis steel, forged solid, with fork end on main rod; parallel rods with solid ends; rod boxes, phosphor bronze.

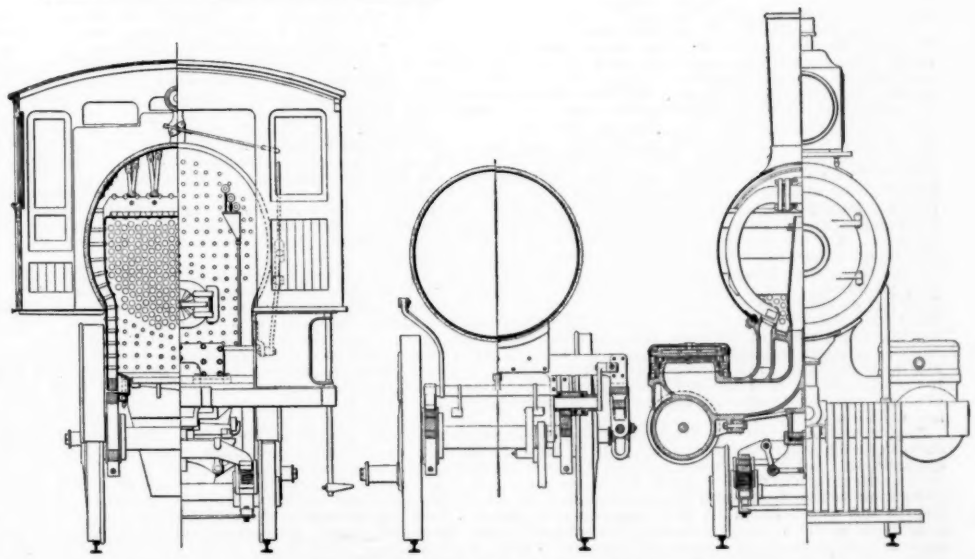
Crank pins of hammered iron, case hardened.

Feed water supplied by one monitor, No. 9, R. H. style, 1888, and one Sellers, No. 9, L. H. style, 1876. All piping copper.

Engine truck, centre-bearing, swiveling, four-wheel swing-motion truck. Truck frame and braces of wrought iron, with cast-iron cross spider fitted with swinging bolster and cast-iron pedestals. Wheels, four double plate chilled wheels of approved make, 23 in. diam.

Axles—Axles of best hammered iron, with inside journals 5 in. in diameter and 8 in. long.

Finish—Cylinders lagged with wood and neatly cased with No. 12 iron. Cylinder head casings of cast-iron, polished bands



Elevations and Sections of the Schenectady Locomotive.

TWO HEAVY EXPRESS LOCOMOTIVES.

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY.

Steam-chest casings of cast iron, sheet-iron centre. Dome lagged with asbestos and cased with cast iron. Boiler lagged with asbestos and jacketed with planished iron, and secured by brass bands. Hand-rails of iron.

Tender.

Tank of steel with angle-iron corners. Bottom plates 3-16 in. thick, side plates 3-16 in. thick, top plates ¼ in. thick, inside of legs ¼ in. thick. Riveted with 7-16 in. rivets, 1½ in. pitch. Capacity, 3,600 gallons.

Tender Frame of white oak.

Tender Trucks—Two centre-bearing trucks, made with wroughtiron side bars and cross-beams of wood with additional bearing at sides of back truck. Chilled wheels of approved make, 33 in. in diameter. Brakes on both tender trucks. Axles of best hammered iron; outside journals 3¾ in. diameter and 7 in. long.

Jerome metallic packing on piston and valve rod.

Nathan double sight feed lubricator No. 8.

Westinghouse brake for drivers, tender and train.

Railroad Telegraph Superintendents' Meeting.

The eighth annual meeting of the Association of Railway Telegraph Superintendents was held at the Ebbitt House, Washington, Oct. 16 and 17. The meeting was called to order at 11 a. m. on Wednesday by President G. C. Kinsman (Wabash). The report of the Secretary and Treasurer for the past year was read and accepted. Twenty-seven new members were elected. About 25 members attended.

The following were elected officers for the ensuing year: C. A. Carlton, Richmond & Danville, President; Geo. T. Williams, New York, Chicago & St. Louis, Vice-President; P. W. Drew, Chicago & Eastern Illinois, Secretary and Treasurer.

A vote of thanks was extended to the Western Union Telegraph Company for offering the use of its wires to the members during the meeting.

The following paper was then read by Mr. Charles Selden, Superintendent of Telegraph, Baltimore & Ohio.

ELECTRIC TRAIN LIGHTING.

I have found the collection of information on this subject a much greater task than I had expected, not only on account of the systems involved, but particularly on account of the claims of the various parties in regard to the system in which they were interested, and especially in dynamo schemes which are so numerous. One of the storage battery companies gives the impression in its circular that it is its system which is being used upon the Pullman limited trains of the Pennsylvania Railroad, and its agent stated to me that its battery, in connection with the Barrett system, was being used entirely by the Pullman Co., and that the Pennsylvania Railroad was using its storage batteries to the exclusion of all others. Upon investigation, however, I found that the Pennsylvania Railroad is using some of the Julien cells, but a majority are from the New York Accumulator Co., and upon investigation with the Pullman Co. I found that it is *not* using the Barrett system, and that while using a number of Julien cells, it is also using a number of the Accumulator Co.'s cells.

Whenever I attempted to get down to figures with any of those exploiters or promoters, I was always met with a general answer, which was of no use whatever to us in considering the introduction of such a system upon our roads. By traveling and carefully noting the devices employed, and then conferring with manufacturers, I became conversant with what ordinarily would be the cost of such things as were in sight, and I am now able to offer you, for probably the first time that it has been done, the *maximum figures* upon at least one system. (This is the system employed by the Pullman Co., and which I designate below as System No. 1), and from this we can deduct the cost of one other (System No. 2.)

I made several trips on the trains and observed the working of this system in all its particulars, spending the better part of three nights' run in the baggage and passenger cars, and it was very satisfactory indeed, the light being brilliant and everything that could be desired. The chief electrician of the Pullman Company very kindly accompanied me to Pullman, showed me through the plant and gave me valuable information. There are some points in this system, however, which were not explained to me, for the reason that there are pending patents; but this does not enter into the matter of cost, and I was told that it was only for this reason that many matters are not at this time made public.

I have examined the Boston & Albany system partially, but as that is a purely storage battery system, I cannot report results in figures until facts are obtainable upon which I can stand and feel assured that the figures which I give will at least not represent a cost less than we would find if put into practice; the figures I herewith give you are therefore *maximum*.

In practice this subject can well be considered under the head of three systems.

1. The joint use of dynamo and storage battery.
2. Direct current from the dynamo.
3. Charged storage battery.

System No. 1 is in use by the Pullman Palace Car Company, upon the limited New York and Chicago trains, the vestibuled trains of the Atchison, Topeka & Santa Fe, and others.

Wiring.—By experience it has been found best to place the wire on top of the cars. For this purpose there is a molding run along from end to end upon the roof of the car, and branch moldings extend to points over the panels, between the ventilators of the car. The latter arrrangement is used for day, smoking or other coaches where it is desirable to have the lamps suspended from the bracket on the side of the car, instead of forming part of the lamp fixture which is in the centre. The main wires or leads are covered in this molding along the top of the car and branches therefrom are either dropped down through the air tube of the ordinary lamp (where centre suspension is desired) or are led through the panel noted above, where it is desirable to have a bracket. On top of this molding is placed another, and then all of this molding is tinned over and securely soldered so that there is no leakage into the car, and the wires are fully protected. They are also free, in a great measure, from any movement by reason of oscillation or jarring, and hence the chances for abrasion of the insulation are reduced to a minimum, while at the same time they can be got at much more easily than if they were placed between the roof and the head-lining. The wiring of a sleeper (on account of the greater number of lights employed) is greater than that of a day coach, but the average cost per car, fitted with the best wire, is about $100.

Engine and Dynamo.—A Brotherhood engine directly connected with an Eichmeyer dynamo, both of them being upon the same cast iron bed-plate, is placed within a latticework enclosure at the forward end of the baggage car, occupying a corner between the end door and the side door. Ordinarily this space is 3⅛ × 5½ ft. This engine is fed by steam from the locomotive, the steam gauge within the baggage car usually showing a pressure of 60 lbs., of which 15 is exhausted through the pipe for heating the train. The dynamo has an electromotive force of 68 and has 60 ampères at 800 revolutions per minute. It should be understood that at 900 revolutions the same machine would give you 80 volts and 80 ampères. A good dynamo of this capacity will give plenty of light for 120 lamps throughout the train, and is considered an economical one for the reason that it has margin enough to serve a longer train than usually carried, so as to meet emergencies should they arise. The Eichmeyer dynamo, while first class in all respects, is especially so for train service. The lattice-work has a door and is also open at the dynamo end so as to admit of placing a tachometer belt upon it, and arranging for the adjustment of the brushes, should it become necessary, but upon the runs I made it was not necessary to adjust the brushes, and there was no sparking at the brushes, even under full load—a most desirable point in favor of this type of machine. Both the engine and the dynamo are fed by an automatic lubricator, which is placed against the side or end of the car, and carries sufficient oil for one or two round trips, and having small service pipes extending to the oil cups, feeding them regularly without the attention of an engineer, other than to see that they are proporly started at the beginning of the run. Against the side of the car is placed a steam gauge, showing the pressure received from the engine, another steam gauge showing the amount of steam going into the heating pipe through exhaust, an ammeter, a voltameter, a test lamp and a speed indicator, the practical use of which will be shown later on. There is a connection device for connecting the cars together, so arranged that, should they part, it will be released, as is now the case with the air-brake pipe. I have been thus full in the explanation regarding the baggage car, because it is, of course, the key to the whole situation.

Storage Battery.—Each car carries in a box securely fastened to the under side of the car 32 cells of storage battery, and under the system of distribution this storage battery is partly in use at all times, furnishing when the dynamo is running 30 per cent. of the power given to the lamps, and when the dynamo is not running, furnishing all the power. Thirty-two cells are used for the reason that the lamps used in this system are all of a high voltage, namely, 63. The weight complete of the battery and its boxes is 1,300 lbs. per car. During the day, ior at other times when the lights are not in use, the dynamo is run a number of hours charging these storage batteries, so that it is unnecessary to remove them from their location under the cars for a long time, dependent, ordinarily, upon whether or not they have been in a wreck, or by long use the plates have become buckled, when, of course, it is necessary to remove such plates and put the battery in good condition.

It is claimed that with this system the storage batteries last longer than where they are subject to removal for recharging at the end of each trip. Whether this is true or not is a question which experience alone would determine, but I am inclined to the opinion that the statement is correct.

Attendant.—This system, as in vogue, has an attendant at $90 per month and board while on the train, who is more or less experienced in electric lighting; and at terminal stations—that is to say, Chicago and New York—an expert ordinarily inspects the condition of the electric service prior to the train leaving, and at the station at Pullman they have also an electric light plant, which is utilized for storing electricity for their cars placed in the shop and which are about to start out on the road.

The arrangement of the engine is such that I do not see why the baggage master should not be able to run it, after a little coaching, without any other attendant. For instance, if we have a gauge for steam from the engine with a notice under it that "This gauge should stand at 65," and under the ammeter: "This gauge should stand at 63," and under the tachometer (speed indicator: "This gauge should stand at 800," it seems to me that any one with the least bit of common sense and a little bit of drilling, would surely be able to run the plant, for (as can be explained to him) if with cock fully open steam should get below the point which you mark and call his attention to, he is to call on the enginemen for more steam. If the revolutions fall below 800 it would at once call his attention to the steam gauge, and if the voltmeter or the ammeter should show out of proportion, the test lamp in the baggage car or the other large lamps in the baggage car would become dim, thus calling his attention, even though he were otherwise engaged. If the enginemen cannot give him more steam, then there is but one thing for him to do, namely, cut off the dynamo entirely and fall back upon the storage battery for the light for the train.

System No. 2.—The system of lighting direct from a dynamo upon a train, without the auxiliary help of a storage battery, is not in use, but I confess that I do not see why it would not be a good thing to do and save the expense both in plant and the depreciation of the storage battery. There is an objection, of course, that in case of any failure, either in connections, engine or dynamo, the lights would go out, leaving the train in darkness. This, however, could be obviated, I think, by keeping one coach candle in each car lit, or one lamp in each car lit. It is necessary to carry lamps or candles anyhow for emergencies. It is also necessary when the steam heat fails to employ as before the Baker or other heater for your cars, so that whether your lamps are lit or not, as a matter of fact there are many times when you have oil in your cars and you have fire in them. The efficiency of dynamos in this day, and especially the one noted, is such that I do not think there will be a failure on account of either the dynamo or the engine amounting to 1 per cent. of the time of its use, while should a derailment occur, I cannot but believe that the storage battery will be just as apt to be rendered useless by breakage as would the other mechanism.

System No. 3.—This is employed by the Pennsylvania Railroad, the Boston & Albany, and some others. I have been unable as yet to get any figures as to the cost. This system consists in merely placing upon each car a number of cells of storage battery (the cost of each cell ranging from $9 to $12), which are usually charged at the terminal points, the batteries then being trucked to the cars and placed therein, running one trip and then being trucked out for recharge.

The Pennsylvania uses a small number of cells (12 to the car) and a low-voltage lamp, namely, 23 volts. This road claims to get 16 candle power to each lamp, but the lamps that I have seen seem to me to be of less candle power, and the cars are not properly lighted for reading. Ordinarily there are seven lights in the body of the car, of 23 volts, one in the smoking room, of 22 and one in each hallway or approach of 24 volts, making in all 10 lights to the car. With the Pennsylvania, at the time of my examinations, these lights were employed only in parlor cars. The best report I could get from that company was to the effect that the officers do not know what the lights cost them, that it had never been figured down in a fine way. They have power and electric light stations at Jersey City and they use a portion of that power for storing currents during the daytime, while at the same time the same power was employed at night in lighting the yards, etc., so that it was a hard matter to get at; but they had determined that while the light was a little more expensive than oil, at the same time it was cheaper than gas as used by them formerly. What I here say as to the cost of this system (*i. e.*, lack of absolute knowledge), is true of all roads using it so far as I could learn from those questioned.

Observations and Remarks.—Referring to the figures that follow, the prices of engines and dynamos can be shaded, while the depreciation noted may in some instances be greater than is shown, or in others less; still I give from the best authority, the consensus of their opinion. Of course, the figures given do not include the cost of steam which runs the engine in the baggage car, but on that subject it was reported to me as follows: The officer of the Pennsylvania Railroad, who has such matters in charge, states that the difference in the consumption of coal upon the locomotives (and this, of course, is the proper source from which I figure) is so slight as between those that are feeding dynamo engines and those that are not doing so as to make no difference practically, and it has not affected the premiums which are given to firemen upon their saving of coal. It seems to me an easy figure, and a good average one, to get at in this way: All things being proper we get ten 16 candle power lights per horse power. Therefore, if you are running 100 lights you are using 10 horse power. I find a difference in the opinion of enginemen upon these trains, some saying that they do not notice, particularly, the loss of steam used by the dynamo engine, or in heating the train, others again complaining that they always feel it.

In order that you might have a basis upon which to figure to light each particular train, I have deemed it best to divide the cars into classes, namely, baggage car, mail coach, day coach, sleeper, dining car. It is necessary to run the baggage car next to the engine in order to get as short connection as possible for steam. By taking the figures which I give, you will be able to tell just about what it will cost in the way of plant for each of these cars, subject, however, to a reduction where the engine or dynamo or other fixtures can be purchased for a less sum than herein named, and it is quite possible, for instance, in the matter of electric light arms and shade holders, that they could be made at railroad shops cheaper than they could be bought. I inclose a statement of each car, which shows the number of the articles used, cost of each, total cost, per cent., depreciation, total depreciation and interest at five per cent. upon the plant. In computing the interest upon the lamps I have placed it upon the depreciation, rather than upon the first cost, for the reason that renewals are necessary during the year; however, the same amount is not invested the whole year, of course, as the first lamps will run a certain time, and so upon the last renewal there would only be interest for any one or two months, but for our purpose I deemed best to show it at the maximum, and I think it will just about cover the breakage—that is to say, where the lamps are broken but not burned out.

Following is the cost per car for each class of car equipped with system number 1 (Eichmeyer dynamo and Brotherhood engine), including depreciation and interest on plant at five per cent., not including salary of attendant:

BAGGAGE CARS.

		Each.	Total.	Depreciation.	Int. @ 5%.
Engines	1	$650.00	$650.00	$65.00	$32.50
Dynamo	1	550.00	550 00	16.50	27.50
Battery cells	32	9.00	288.00	47.52	14.40
Connections	1	20.00	20.00	.....	1.00
Wiring	1	100.00	100.00	.....	5.00
Piping, steam gauge, lattice work, lubricator and tachometer	1	128.00	128.00	.....	6.40
Voltameters	1	42.50	42.50	.....	2.13
Ammeters	1	32.50	32.50	.....	1.63
Safety switches	1	20.00	20.00	.....	1.00
Lamps	5	.75	5.75	26.95	1.35
Lamp sockets	5	1.10	5 50	.06	.28
Total	..	.....	$1,810.25	$156.03	$93.19

MAIL COACH.

		Each.	Total.	Depreciation.	Int. @ 5%.
Battery cells	32	$9.00	$288.00	$47.52	$14.40
Wiring	1	100.00	100.00	.....	5.00
Lamps	8	.75	6.00	42.00	2.10
Lamp sockets	8	1.10	8.80	.09	.44
Cut-outs	1	.45	.45	.....	.02
Switches	1	4.00	4.00	.....	.20
Connections	1	20.00	20.00	.....	1'00
Total			$427.25	$89.61	$23.16

DAY COACH.

		Each.	Total.	Depreciation.	Int. @ 5%.
Battery cells	32	$9.00	$288.00	$47.52	$14.40
Wiring	1	100.00	100.00	.....	5.00
Lamps	14	.75	10.50	73.50	3.68
Lamp-sockets	14	1.10	15.40	.15	.77
Cut-outs	1	.45	.45	.....	.02
Switches	1	4.00	4 00	.....	.20
Connections	1	20.00	20.00	.....	1.00
Shade-holders	14	.18	2.52	.....	.13
Shades	14	.35	4.90	.49	.25
Electric light arms	14	1.15	16.10	.....	.81
Total	..	.....	$461.87	$121.66	$26.26

SLEEPERS.

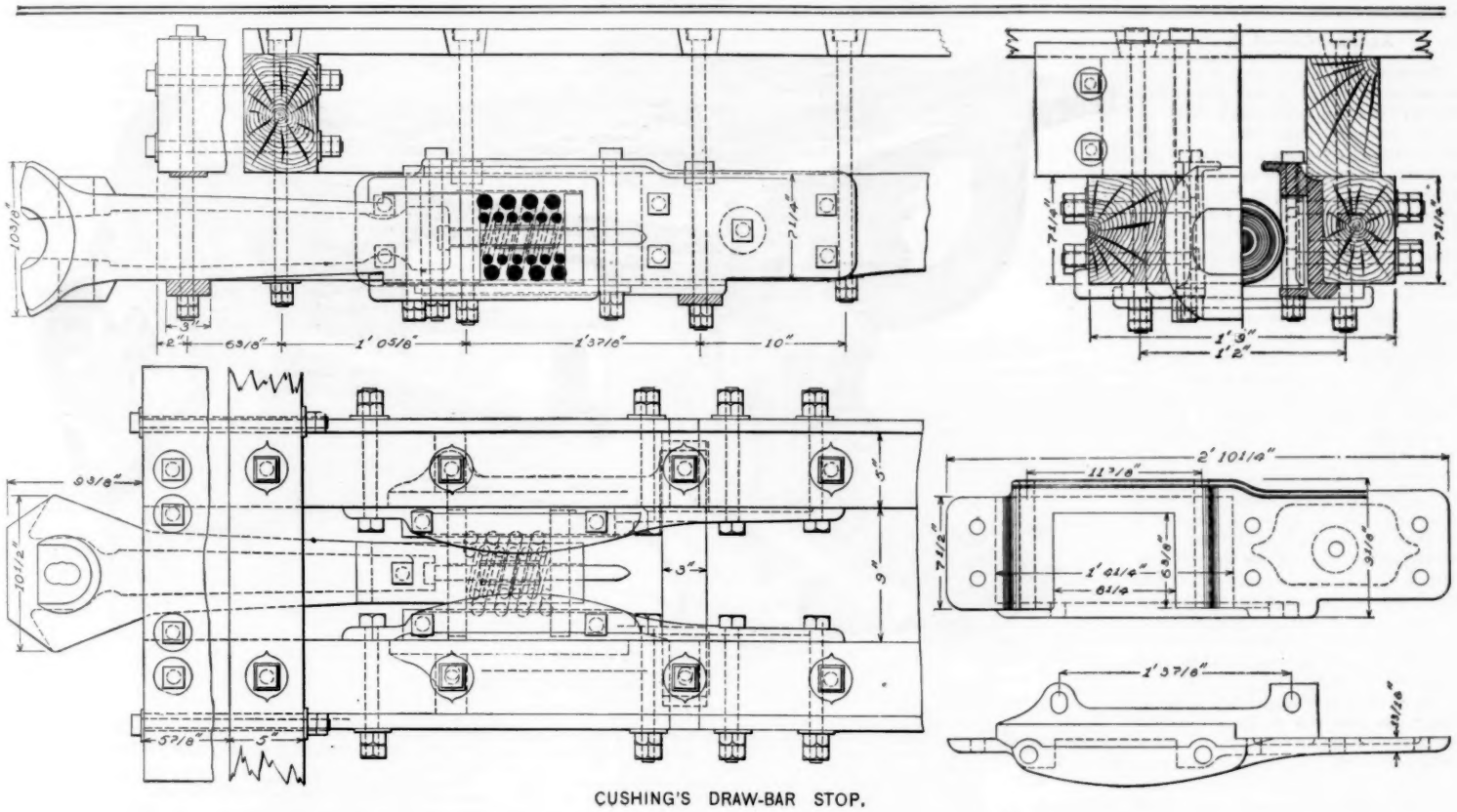
		Each.	Total.	Depreciation.	Int. @ 5%.
Battery cells	32	$9.00	$288.00	$47.52	$14.40
Wiring	1	100.00	100.00	.....	5.00
Lamps	26	.75	19.50	135.50	6.83
Lamp-sockets	26	1.10	28.60	.29	1.43
Cut outs	1	.45	.45	.02	.02
Switches	1	4.00	4.00	.....	.20
Connections	1	20.00	20.00	.....	1.00
Shade-holders	26	.18	4.68	.....	.23
Shades	26	.35	9.10	.91	.46
Electric light arms	26	1.15	29.90	.....	1.50
Total	..	.....	$504.23	$185.22	$31.07

DINING CAR.

		Each.	Total.	Depreciation.	Int. @ 5%
Battery cells	32	9.00	288.00	47.52	14.40
Wiring	1	100.00	100.00	.....	5.00
Lamps	21	.75	15 75	110.25	5.52
Lamp-sockets	21	1.10	23.10	.23	1.16
Cut-outs	1	.45	.45	.....	.02
Switches	1	4.00	4.00	.....	.20
Connections	1	20.00	20 00	.....	1.00
Shade-holders	21	.18	3.78	.....	.19
Shades	21	.35	7.35	.74	.37
Electric light arms	21	1.15	24.15	.....	1.21
Total	..	.....	$486.58	$158.74	$29.07

Upon the above basis a train as follows would cost for 365 days of 10 hours each—System No. 1:

Car.	Lamps.	Depreciation.	Interest.
Baggage	5	$156.03	$93.19
Smoker)or day)	14	121.66	28.26
Day	14	121.66	28.26
Two sleepers	52	370.44	62.14
Total	85	$769.79	$207.85
Total as to equipment			$977.64
Add attendant at $90 per month			$1,080.00
Total			$2,057.64
Total per day			$5.64
Per lamp, per day			.066
Per lamp, per hour			.006
Per lamp, per hour			.33
Or for a baggage car, per day			.92
For a day car, per day			1.72
For a sleeper, per day			



CUSHING'S DRAW-BAR STOP.

I think I have placed before you the details in such shape as to admit of easy figuring for any kind of a train.

System No. 2 would be as much cheaper than System No. 1 as the cost of battery and its depreciation would amount to. Either system (1 or 2) without an attendant becomes still cheaper.

Should you deem best to recommend the lighting of trains, now that you have what I believe to be figures beyond which the cost will not go, I shall be glad to furnish any further information possible for me to obtain.

DISCUSSION.

In response to an inquiry whether proper allowance had been made for mishaps to the apparatus, Mr. Selden said that he had included it in the depreciation of plant. He had recommended to his company that a trial be made without the use of storage battery, as suggested in the paper.

Mr. NICHOLS (C., B. & Q.) said that his road had made experiments in lighting coaches on suburban trains, and after a very complete series of tests it was found that the cost of lighting exceeded that of the Adams & Westlake oil lamp, one of the burners of which was rated at 120 c. p. It was not equal to that, however, but did exceed the illuminating capacity of an incandescent lamp. The company had decided to stick to oil for the present, although the objections to its use arising from danger and damage had received due consideration. He had used 30 accumulators costing $22 each. The lighting was not satisfactory from an economical standpoint.

Mr. SELDEN added that the object of his investigations had been to get down to actual figures, and not those of promotors. The second system alluded to in his paper was a suggestion of his own, and, if feasible, led to a saving of about $1,000 per year. The oiling of the machinery was entirely automatic and he believed that any baggagemaster of ordinary intelligence could run it. The people who occupied sleepers should not be encouraged to read or play poker.

Mr. LEONARD (C. & O.) did not think it possible to have the baggagemaster attend to the dynamo. In the event of trouble in the wiring, the men in charge of plants have to test up the cars and perhaps cut one out. The baggagemaster could not leave his car and the engine could not always spare the necessary steam for continued operation. The question resolved itself into whether we should use the storage battery or a combination of the same with a dynamo on the train.

Mr. TAYLOR (Pennsylvania), replying to an inquiry as to the relative cost of lighting by gasoline, using carbureters, said that he could not state the difference, but he had no doubt that the cost of lighting by storage batteries exceeded that of any other system.

Mr. SELDEN admitted that there was a liability of the apparatus getting out of order, but that it would not be difficult to arrange an automatic device for cutting out a car and substituting other illumination. He had devised such an attachment himself, but the Washington authorities did not consider it an invention. In it he had arranged for a magnet to scratch a match and light the candles, and also for the dropping of a cap to extinguish them. The attachment would cost about $2 per lamp. He agreed with the last speaker as to the cost of lighting by storage battery exceeding that of any other system.

Mr. NICHOLS disagreed with the author of the paper on the suggestion of having the baggage master take care of the lighting plant. The Brotherhood engine runs at a very high speed, and such an engine requires constant attention, and as any variation in speed not only affected the efficiency of a lamp, but its life as well, he believed it entirely impracticable to employ an unskilled man for such work. His company had had some experience in lighting up its general offices in Chicago. It was suggested that accumulators be used, to be charged during the day, so as to dispense with a night engineer, and also that a cheaper man be employed. They had come to the conclusion that it was necessary to have a good man constantly in attendance. If this was the case with an engine running at 250 revolutions, it would be still more necessary if using an engine making say 1,000 revolutions. The matter of lubrication was very important, and the details of the work required skilled attendance.

Mr. LEONARD said he had heard no reference to the fact that in England they had utilized the motion of the train for lighting by belting the dynamo to the axle of the guards' car, in combination with a storage battery, and an automatic regulator that cuts the battery in and out, or the dynamo in and out when necessary. He believed a system of this kind was in use on two or three roads in England, and a report from those six months ago showed that it was very economical.

Mr. NICHOLS said that a few months ago he had investigated a scheme for heating as well as lighting. The inventor proposed to place a dynamo on every car, driven by an axle, and by placing a resistance coil in water cylinders be expected to dispense with the use of coal. He had forgotten that the energy required to drive the train cost something, and we should not lose sight of the fact that every time we transfer energy we encounter a loss. He had heard of running a dynamo from the axle, but was not aware that it continued in practical use.

Mr. LANG (N. Y. &. N. E.) stated that he had heard within a week that the Connecticut River Railroad had made extensive experiments with a dynamo driven by the axle, and the apparatus was so arranged that it was connected only when the train was running down grade, the lamps being supplied from accumulators all the time. He could not vouch for the truth of the report, as he had had no opportunity of investigating it.

At 12:45 p. m. the meeting adjourned until 3:30 p. m., and the members availed themselves of an opportunity to call on the President of the United States in a body.

The meeting reassembled at 3:30 P. M. and took up the list of topics which had been prepared for discussion.

Mr. Selden reported on "Ciphers" that he had found the use of a code very advantageous, but had not realized until he undertook it the immense labor of preparing one. The code prepared for his company embraced about 9,000 phrases, but he thought it could be very much reduced. Its value had been proved by the general passenger agent in communicating with distant subordinates where there was sharp rivalry between the agents of different roads in securing excursions. The code has also proved useful in reducing the volume of telegraphic business.

On the subject of "Night Messages," Messrs. Leonard and Darlton united in stating that they had found it a great relief to their business to hold over unimportant messages until night, when the wires were not so fully occupied. This practice was peculiarly adapted to some of the long southern lines, and Mr. Darlton added that by classifying their messages in this way they had avoided the necessity of stringing another wire. Mr. Selden added that he successfully introduced a similar classification of messages on his line.

Mr. Lattig had been expected to take up the topic of the "Induction or Train Telegraph," but owing to his unavoidable absence Mr. Taylor was called upon, who stated the system as used on the Lehigh Valley had been investigated by him, but that he had not been able to conceive of any place on the Pennsylvania Railroad system where it would be of sufficient advantage to warrant its introduction on passenger trains, while their block stations were so numerous and their track system so complete, it would be of little value for their construction trains. It would cost $20,000 to introduce it between New York and Philadelphia, while, of course, for the main line between Pittsburgh and Philadelphia the cost would be very much greater. He did not wish to be understood as disparaging the system, but it did not appear to be a valuable acquisition to their line.

Regarding the "Phonoplex," which was another topic brought up for consideration, Mr. Taylor stated that they were using five circuits equipped with the apparatus, the longest being 117 miles, and it was giving satisfaction. The maintenance of the battery was the only thing to which objection could be raised, but he thought that would be overcome and he was now experimenting in that direction, hoping to have a battery which would last from three to six months without attention. He understood a circuit 300 miles long was being worked in the West, and another of 500 miles was being equipped. Its successful working depended largely on the physical condition of the lines. Its operation required seven cells of Bunsen battery, which was renewed twice a week on a line worked to its fullest capacity. They had been using it for two years.

"Delaney's Line Adjusting System" was then taken up. Mr. Lang said he presumed all present had seen the apparatus in the exhibition room. He had a pair of the instruments in use on a wire 117 miles in length. There had been but a few bad days since it was introduced, but on the previous Monday the weather was very bad, and he was informed by his dispatcher that they could hardly have got along without it. Where operators at small stations had other duties to perform they could not give such constant attention to their instruments as was necessary in wet weather, in order to keep in adjustment.

Several members had visited and examined Mr. La Dow's mechanical Morse transmitter, which has been used by the inventor some months on the New York *Tribune* wire between Washington and New York. It has a Remington keyboard, and by its use the Morse characters may be sent perfectly and with greater rapidity than by using the ordinary key, with far less strain upon the operator, while it is perfectly adapted for use by those who are afflicted with "operator's cramp." The inventor himself is afflicted with this peculiar disease, which led to his contriving this very ingenious machine. A Morse operator familiar with the typewriter keyboard has no difficulty in using the instrument after a few hours' practice. Mr. Leonard, who among others had seen the apparatus, spoke very favorably of it.

It was the intention to discuss the "Block System," but on account of the importance of the subject, it was thought best to postpone its consideration until the June meeting, and meanwhile members would have an opportunity to prepare themselves.

The exhibits were located in a room opposite the Ebbitt House, and were visited by the Association in a body during the noon recess on Thursday. The Delany Line Adjusting System was shown in operation, also the Phonoplex, and the Magneto Signals of the Pennsylvania Steel Co. Mr. Delany also showed his new gravity cell, in which the blue vitriol is loosely enclosed in a box made of straw board. A fine display of Morse instruments, measuring apparatus, etc., was made by J. H. Bunnell & Co. and the Western Electric Co.

At 5 P. M. on Thursday, the meeting adjourned to convene at Niagara Falls, June 18, 1890.

Cushing's Draw-bar Stop.

The draw-bar stop which we show here was designed and is patented by Mr. G. W. Cushing, Superintendent of Machinery of the Union Pacific Railway, and is now applied to the freight cars of that road. It is a matter of common experience that a large percentage of the repairs to freight cars are made necessary by defective draft rigging. The draw-bar stops which Mr. Cushing found in use on the Union Pacific were made, as is usual, with the front and back stops cast in separate pieces. These were tied together by the draw-bar guides, and in practice were found weak and defective. The heavy pulls from large engines, and the severe butting shocks soon loosened the bolts that fastened the stops, and in a short time destroyed the draft timbers.

In the design here shown the front and back stops are in one piece and constructed to distribute both pulling and butting shocks equally through both stops. The length and form of the stop are also calculated to produce the mimimum strain in the draft timbers. That part of the plate which unites the front and back stops is let solidly into the draw-bar timber, thus taking off much of the strain from the bolts. At the same time, it forms an upper draw-bar guide, and is designed to be easily taken out. The number of pieces is somewhat reduced by this construction, and the form is such as to give strength with minimum weight.

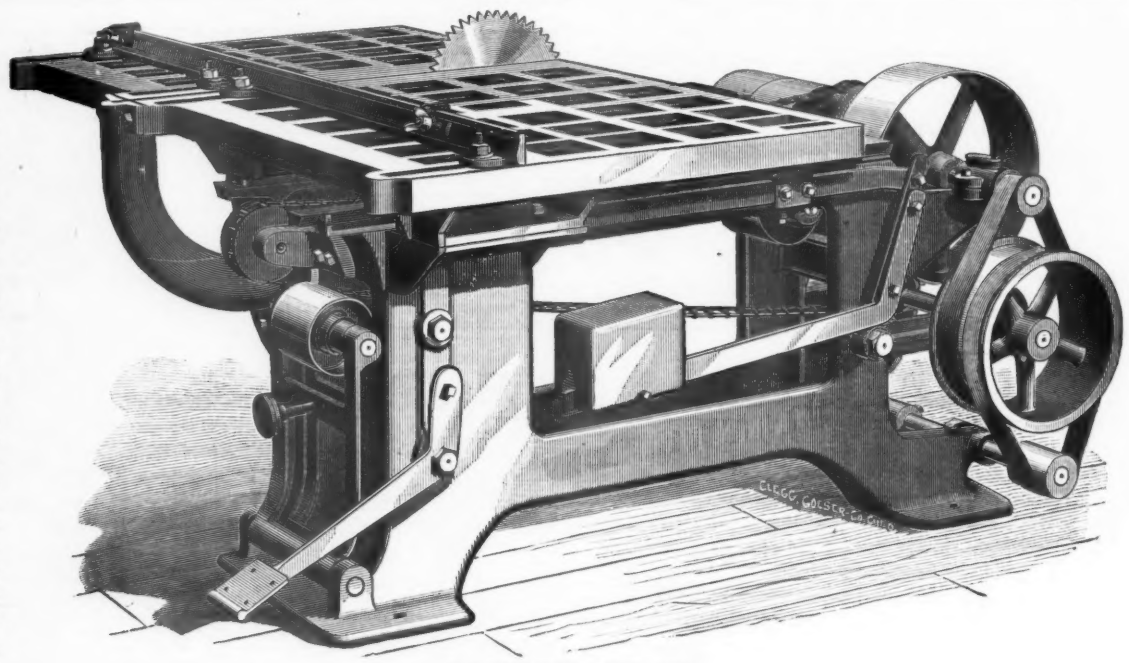
This draw-bar stop is provided with wrought-iron cross bars, held in position by bolts which pass through lugs cast on the stops, and the combination of bolts and tie braces strengthens the draw timbers, and the lugs take off much of the strain which would otherwise come on the timbers. This device can be used to replace the ordinary form of draw-bar stop without much change in the general arrangement of parts.

The St. Clair Tunnel.

Work on the Canadian side has been advanced rapidly during the past week, and 35 ft. of the tunnel lining has now been placed in position. The shield has been traveling at the rate of 8 ft. per day during the past 10 days. The work is now entirely under ground. The narrow-gauge tracks have been laid in the tunnel, and the clay is now passed back through the shield, loaded on a small hand car and taken to a point from where the tunnel work began, when it is hoisted out by a crane. The work of tunneling on the American side has been suspended to allow the shield to be braced. About 400 ft. of the tunnel is completed at the American end.

Railroad Cut-off Saw.

This is a new tool for wood-working establishments, made by the Eagan Co., 202 W. Front St., Cincinnati, Ohio. It has an automatic chain feed, giving the saw carriage an extreme stroke of 30 in., adjustable at pressure, down to 1 in. By a pressure on the treadle, the saw carriage is held in any desired position, and when this treadle is released the saw carriage is returned to the commencement of its stroke by the action of the counter-weight. There is also an adjustable stop, which can be set so as to limit the stroke for a fixed class of work. The frame of this machine is a single casting, and there is an iron table, as shown in the illustration. The saw is also furnished without this table when desired; a rest being fitted, in this case, for the attachment of a wooden table. The saw mandrel is of cast steel, with an expansion device to fit saws having holes of different diameters. The pulley on the mandrel is between the bearings, and there is a swinging belt tightener for the belt connecting the pulley on the counter-shaft with the pulley on the mandrel, which keeps the tension of the belt constant at every position of the saw-carriage. The top of the frame is planed true, so as to form guides for the saw-carriage.



RAILROAD CUT-OFF SAW.

The manufacturers claim that with this saw "one man will do three times as much work as can be done with the old style machines, and with one-fourth the labor formerly exerted."

Adhesion Compared with Rack Railroads.

A paper on this subject, which was published more than a year ago in the *Journal of the German Railroad Union*, appears in substance in a recent issue of the "Abstracts of Papers," Institution of Civil Engineers. We give it not because of the value of the conclusions, but as containing considerable interesting information.

The problem to be solved may be expressed as follows: Up to what gradient can adhesion locomotives be employed for uninterrupted and safe transport of a given amount of traffic? or, in other words, at what gradient does the usefulness of a rack locomotive begin?

The most important point to be ascertained is the value of the coefficients of adhesion. It is not sufficient to know the maximum to which this value can rise, nor the minimum to which it can fall. The ruling factor is the average or mean value which adhesion attains in ordinary conditions of weather. The experience gained up to the present time on various mountain railroads worked by adhesion offers valuable and sufficient data.

The late Mr. Stocker, Locomotive Superintendent of the St. Gothard Railroad carried out exhaustive experiments, in order to obtain the most accurate values possible for the coefficients of adhesion upon the following mountain railroads:

1. The Brenner & Puster Valley Railroad, ruling gradient 1 in 40, smallest curve radius 285 metres (935 feet).

2. On the Apennine Passes: Pistoja-Poretta, gradient 1 in 38.5, with many sharp curves and many tunnels; Pontedecimo-Busalla (Giovi Railroad), gradient 1 in 28.5, without tunnels and with easy curves.

3. On the Bussoleno-Modane section of the Mont Cenis Railroad, gradient 1 in 33, curves comparatively easy.

The results of these experiments, for which Mr. Stocker used eight-wheel coupled engines with 51 to 53 tons weight on driving wheels, were published in the "Eisenbahn," of Zurich, in 1878. It is there shown that the maximum coefficient obtained for the adhesion was $\frac{1}{4.7}$ during a trip on the southern approach to the Mont Cenis tunnel, on which inclines 1 in 33 occur. It does not appear advisable, however, to accept this unusually high coefficient as a standard, since it could only be reached under unusually favorable conditions of weather.

On the Tyrol railroad Mr. Stocker arrived at an almost identical coefficient when using exceptionally good sand—that is to say $\frac{1}{6.5}$; still, for these lines, when the question of train-load was being determined, a maximum coefficient of $\frac{1}{8.3}$ was, according to Kramer, that assumed for the calculations.

In a general way, under normal circumstances and not unfavorable conditions of weather, the coefficient of adhesion may be taken at between $\frac{1}{7}$ and $\frac{1}{8}$, for Stocker found, on the open portion of the Giovi Railroad, on gradients of 1 in 28.5, that the adhesion was almost invariably equal to $\frac{1}{7}$ of the weight, while on the Apennine Pass Pistoja-Poretta it was in the proportion of 1 to 7.6.

The late Mr. Victor Kramer, Locomotive Engineer of the Austrian Southern Railroad at Innsbruck, fully confirms these results in his treatise "On the Locomotive Service of the Brenner Railroad." He there speaks of adhesion as a thoroughly capricious factor, which, from a maximum value of $\frac{1}{4}$ in the best season of year, falls, under special circumstances to as low as $\frac{1}{15}$. Even leaving out extreme cases, one cannot reckon on more than $\frac{1}{8}$ in summer, and, with the help of sand, $\frac{1}{6}$ in the winter. Further on he states that the average value of the coefficient of adhesion can, under ordinary circumstance, be taken at $\frac{1}{7}$.

Both these authorities repeatedly, and with conclusive evidence, call attention to the influence which variations in temperature and the state of the weather exercise upon the adhesion, and these are precisely the points which are of peculiar importance since they are intimately connected with the circumstance of the elevated position of a line. For instance, in the case of the Giovi Railroad, as soon as the south wind sets in, bringing moisture from the sea, the coefficient of adhesion falls to $\frac{1}{9}$; on the Brenner Railroad, a coefficient of $\frac{1}{8}$ is assumed for calculating the train load for unfavorable conditions of weather, although it really, according to Stocker's observations, very often falls as low as $\frac{1}{9}$ and even $\frac{1}{10}$.

In tunnels, a great reduction in the adhesion invariably shows itself. This can frequently be observed on the Semmering Railroad; cases occur where trains have been appreciably delayed solely in consequence of repeated and continued slipping of the driving-wheels. In the Mont Cenis tunnel, with a ruling gradient of 1 in 43, the coefficient of adhesion seldom exceeds $\frac{1}{7.5}$, and is generally considerably less.

The foregoing observations tend to show that a locomotive—supposing its total weight to be utilized for adhesion—can, even under favorable conditions of weather, only move 1.3 time its own weight up a gradient of 1 in 20, or, on a gradient of 1 in 16.6, only the equivalent of its own weight; and, therefore, an eight-wheel coupled engine of 50.5 tons load on driving wheels can only, on an incline of 1 in 16.6, transport a useful load of 23.5 tons, beside its tender of 27 tons. Each engine on the Harz line, from Blankenburg to Tanne, weighs 57 tons, and, by help of the rack rail, transports a train load of 122 tons at 6.2 miles speed, up an incline of 1 in 16.6; had the same train to be worked by adhesion locomotives, two tank engines, each with 61 tons load on the driving wheels, would be necessary. A regular traffic with such train loads could not, however, be depended on, owing to the great variations in the adhesion.

The employment of the rack rail affords just this important advantage, that a given amount of traffic can be satisfactorily maintained under all circumstances with perfect regularity, even on gradients where the variations in the adhesion would show themselves in a most injurious manner, and prove a source of great inconvenience and even danger.

It is true that there are railroads worked by adhesion alone, where inclines of 1 in 16.6 and even one in 12.5 occur; in most cases they are, however, only tourist railroads, having to deal with a comparatively light traffic, and this only during the most favorable time of year. Nevertheless, it appears that the use of adhesion alone on such venturesome inclines is permissible only in exceptional cases. The author witnessed a case on the Uetliberg Railroad, where, on a rather foggy day, the locomotive could scarcely move its extremely light train on a gradient of 1 in 12.5 in consequence of slipping of the driving-wheels.

When instances are quoted of adhesion engines, of say 45 tons weight, moving a dead load of 100 tons on gradients of 1 in 16.6, it is not necessarily a matter for doubt, since during the construction of the Mont Cenis Railroad on the temporary line built on the Fell system, with inclines of even 1 in 12, trains were run without using the centre rail. But such instances are only exceptions which may occur with more or less frequency.

The coefficient of adhesion has also, however, a most important part to play for the descent of an incline, as regards the safety of the traffic; and here in the choice of gradients the assumption of too high a coefficient may involve a constant danger. On the Semmering Railroad, a case occurred where a descending goods train—in which the auxiliary engine, previously employed to push a train up a bank, was now coupled in front of the engine—could not be controlled on a gradient of 1 in 40; or, in other words, fairly ran away, because the speed on passing from the horizontal to the 1 in 40 decline had probably not been checked soon enough. The train could only be brought up on a gradient of 1 in 100; and, as all the brakes were duly applied, it is probable that the case would not have occurred if the adhesion had been sufficiently great.

A similar incident on the Brenner Railroad is mentioned by Stocker in the paper before referred to: "An ordinarily heavy train with two engines, which left Franzensfest at night in bad weather, had lost time on the ascent, and exceeded all prescribed limits of speed between stations in descending the Brenner. In spite of the constant whistling by the drivers owing to the increased speed of the train, the wagon brakes only worked on each occasion just before the station was reached." During the trip, Stocker several times remarked the speed to be increasing, although both the tender engines had their full brake power exerted all the time, and he considered the coefficient of adhesion on this occasion to have been not more than $\frac{1}{7}$.

Kramer expresses himself as follows with reference to the descent of gradients: "Downhill it is always the question of safety which is of primary importance, and half measures must not be thought of. Here again that capricious element, the adhesion, plays the chief part, whether considered as traction power or brake power. There are cases, and especially in places lying at great elevations above sea-level, where the coefficient of friction certainly does not exceed $\frac{1}{12}$, and is possibly even less than that value, as, for instance, when sleet is falling and the temperature is almost at freezing point. Here sand alone can more or less help. Even supposing that it is tolerably effective as regards the engine brake power, still the other brakes get but little benefit from it, as the sand layer on the rails is soon rubbed or washed off."

The employment of sand affords, it is true, an excellent means of increasing the adhesion, since the grains of sand, by their being driven into the surface of rail and wheel, constitute, as Stocker most correctly remarks, no less than a very imperfect rack and pinion, so that on mountain railroads where the use of sand is customary, the principle of pure adhesion is, properly speaking, already broken through. Even then sand cannot be depended upon under all circumstances, and must, when a really good result is desired, be of the very best quality. Experience on the Semmering and Brenner railroads shows that on inclines of 1 in 40 the driving wheels slip to such an extent, in spite of sand, and especially in the damp tunnels, that the trains almost come to a standstill.

Washing the rails by means of a jet of water has proved more advantageous than even sanding; Stocker calculates, upon the basis of experiments made in the Hauenstein tunnel on the Olten-Läufelfingen line, that the coefficient of adhesion which can with certainty be attained by the use of a water-jet, is $\frac{1}{6.55}$; whilst he observes that it is highly probable that it is even higher.

By the gearing of the pinions into the rack a much more powerful result must necessarily be produced than by the use of sand or water; the efficiency of the locomotive for the ascent of a gradient, and the safety of the traffic for the descent, will be much greater than on an adhesion line for similar inclines.

According to the experiences already cited, the opinion most decidedly expressed by Mr. Kramer in the before-mentioned paper, on the subject of adhesion locomotives, can only be agreed with when he declares as follows:

"It seems, therefore, in every way appropriate that the German Railroad Union has agreed to fix 1 in 40 as the limit of steepness of gradients which is not to be exceeded; since beyond that limit the working of a line by locomotives becomes less and less justifiable."

As soon, therefore, as this fact has been acknowledged which has been proved in practice, or, in other words, as soon as the conviction has been arrived at, that, if the traffic is to be regular, safe and economical, an adhesion railroad may not be constructed with such daring gradients as a rack railroad, then it will be seen that a line of the latter type must form beyond dispute the shortest route by which to connect any two given points at considerable elevations above the sea.

This shortening of the route, which is frequently considerable, has the further result of rendering unnecessary various expensive works when laying out the line, thus reducing the cost of construction, to say nothing of the time gained and the diminished interest payable on the building capital, all the traffic expenses being also reduced. Had the Semmering Railroad, for instance, been led straight away from Glogguitz through the Schottwien Valley and a rack railroad with gradients of say, 1 in 20 employed, the line would have been 15 kilometres shorter, and many millions of florins would have been saved by this reduction in length and by the smaller number of costly tunnels, viaducts, etc., the same rule finding universal application, which holds good in this special case.

The Johnson Railroad Signal Company.

The works of this company at Rahway, N. J., although comparatively new, are of considerable extent, and are well equipped for interlocking work in all its details. It is not the purpose of the company to make frogs and switches, but to confine its work strictly to interlocking. The shops comprise office, draughting room, pattern shop, machine and blacksmith shops and foundry. The machine shop is equipped with all necessary tools, and the foundry work is particularly clean and well finished. The shops are very conveniently situated, beside the main line of the Pennsylvania railroad, with a spur track into the works.

The company makes interlocking machines, signals of all the accepted forms, selectors, compensators and all the details necessary for complete signaling outfit.

The larger orders which are now in hand or have been recently completed for interlocking machines are as follows: For the Pennsylvania Railroad, Millstone Junction, 32 levers; Morrisville, 16 levers; Irvington, 6 levers; Warren, 4 levers; for the Manhattan Elevated at 127th street and Third avenue, 24 levers; for the Erie, at Goshen, N. Y., 20 levers; for the Lake Shore & Michigan Southern, at Toledo, 12 levers; for the Savannah, Florida & Western, at Savannah, 24 levers; for the New York, Ontario & Western, at Burnside, 4 levers. The interlocking plant at Savannah will be opened to-morrow. In addition to these the company has recently completed a very important work at Cleveland, O., in the signaling and interlocking of a drawbridge on the line of the New York, Pennsylvania & Ohio. The tower is located at the centre of the draw, and from it are operated a large number of signals and switches. The details of this work we hope to illustrate shortly.

The machine built by this company preferably is the John-

son machine, which was fully illustrated in the *Railroad Gazette* of Jan. 18, 1889. This machine is, as will be remembered, a clever adaptation of the Stevens principle of locking with latch rod actuation. The locking is all placed on vertical tappets, which are below the floor of the operating-room of the tower, and are readily accessible for inspection, cleaning, repairs or changes. There is probably no system of locking which is so well adapted to special locking as this, and the improvements made by the Messrs. Johnson enable them to do a great deal of special locking with very little complication of parts. They build also the Saxby & Farmer machine for those who prefer it, and have now on hand a Saxby & Farmer machine with an auxiliary arrangement of the Stevens locking. In this case the "flops" are interlocked by the well-known method, and are also continued through in front of the machine and actuate tappets placed upright in an auxiliary frame, which are interlocked by the Stevens system. In this auxiliary locking will be arranged the special locking required to meet the case for which this machine is building.

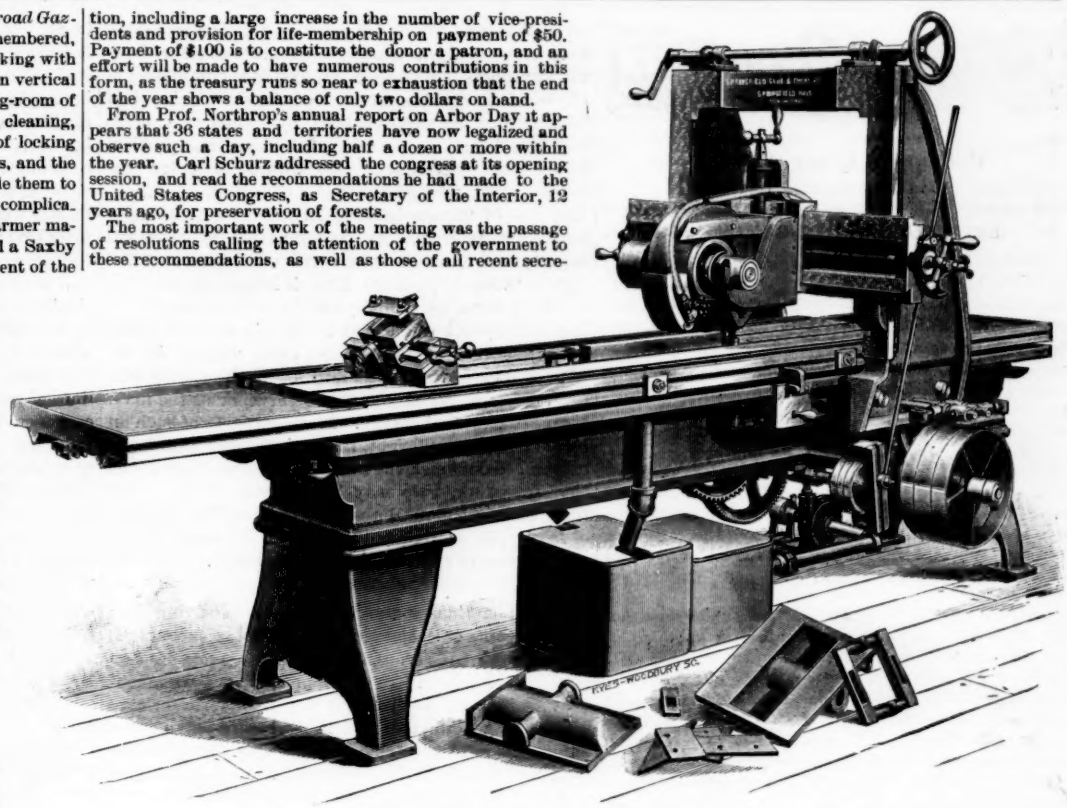
The company has perfected a remarkably neat dwarf semaphore, carrying a single blade and any required number of indicators. In this semaphore the parts are light, compact and admirably arranged to take up the least possible space, which is a great advantage, as such signals must often be placed between tracks. The movement of the signal and indicators on this dwarf stand is a patented device, which locks the signal in its position either at danger or safety. The selector and the liquid wire compensator, patented by Mr. Johnson, are also to be seen at these works.

Emery Wheel Surface Planer.

This machine is especially adapted for surfacing iron in the rough where but a small amount is to be taken off, and for finishing or cutting down work where the material is hard, as chilled iron, steel dies, punches, etc. On tempered work it saves drawing the temper and rehardening, and the work is true when done. It is also adapted to finishing work that has been roughed off on a planer where it is desired to take out the tool marks.

The emery wheel cuts as fast when the carriage is running backward as when running forward, and it will grind freely the hardest castings. Castings have only to be made a little above the actual size to finish, as the surface planer only needs to remove enough stock to bring the work to a nice finish.

The work can be fastened to a carriage by the ordinary method used on iron planers. A folding hood nearly surrounds the wheel, which prevents the water flying off, and is adjustable to the wearing away of the wheel. A centrifugal pump is attached to each machine, piped, with valve to regulate the flow of water on the wheel. The water is taken from a tank on the floor under the machine. A channel on each side of the carriage catches the water and conducts it through holes drilled at the bottom of the channel, midway between the ends of the carriage, into the troughs cast to the sides of the planer bed. An iron pipe on each side of the bed conducts it from the troughs to the tank under the machine, where the sediment settles and comparatively clean water overflows from the top of this tank into a second one, where the pump takes it, using the water over and over. The pump furnishes a large supply of water, which prevents heating and drawing the temper and gives a fine finish, and the grinding can be done faster as a consequence. Moreover, it prevents loose emery flying on the working parts and on the neighboring machinery. The machine has an improved system of idlers, to be fastened to the ceiling, for keeping the belt that drives the wheel at a proper tension. As the emery wheel is raised or lowered for work of different thickness the idlers are run in and out by a system of bevel gears and screws operated by a hand wheel within easy reach. It is provided with a patent belt shifter for the carriage motion, which is arranged to start one belt enough in advance of the other to prevent all screeching of belts when reversing motion of carriage. The size shown is made in six different lengths, respectively, taking in work 4, 7, 9, 12, 15 and 18 ft. long. The machine is made by the Springfield Glue & Emery Wheel Co., of Springfield, Mass.



EMERY WHEEL SURFACE PLANER.

Made by the SPRINGFIELD GLUE & EMERY WHEEL CO., *Springfield, Mass.*

The American Forestry Congress—Philadelphia Meeting.

The growing interest in the Forestry Congress was evident at the Philadelphia meeting, Oct. 15-18. Never before has the press so fully reported proceedings, nor so widely made editorial comment on the congress, its aim and importance as now, and this not merely at Philadelphia, but throughout the country. In his annual report Secretary Harrison noted the great increase of attention given to it by the press, the special stimulus dating from the Atlanta meeting last December, of which the *Railroad Gazette* published a special report. The broadening of the field of the congress dates from that meeting, when the union of the Southern with the American Congress gave it a thoroughly national scope; indeed, it is international, for Mr. Joly, of Quebec, one of the vice-presidents, alternated with Governor Beaver, of Pennsylvania, the President, in occupying the chair. Peculiar local interest was aroused by the widespread feeling that the disastrous freshets in Pennsylvania were aggravated by the loss of forests.

The congress was the guest of the Pennsylvania Forestry Association. Governor Beaver was re-elected prenident and Dr. Fisher, of Philadelphia, treasurer, while C. C. Burney, of the same city, was elected corresponding secretary, in place of Harrison, thus concentrating officers at that point for convenience in securing a quorum of the executive committee during intervals between annual meetings.

Numerous and radical changes were made in the constitution, including a large increase in the number of vice-presidents and provision for life-membership on payment of $50. Payment of $100 is to constitute the donor a patron, and an effort will be made to have numerous contributions in this form, as the treasury runs so near to exhaustion that the end of the year shows a balance of only two dollars on hand.

From Prof. Northrop's annual report on Arbor Day it appears that 36 states and territories have now legalized and observe such a day, including half a dozen or more within the year. Carl Schurz addressed the congress at its opening session, and read the recommendations he had made to the United States Congress, as Secretary of the Interior, 12 years ago, for preservation of forests.

The most important work of the meeting was the passage of resolutions calling the attention of the government to these recommendations, as well as those of all recent secretaries, and especially asking it to reserve from sale and settlement the forests at headwaters of Rocky Mountain rivers, so vital to the irrigation systems necessary in that vast area. This is already being done to a considerble extent, under authority of the act of Oct. 8, 1888, as Mr. Hinton, of the Geological Survey, informs us. Another set of resolutions calls on agricultural colleges to make prominent the study of forestry. Resolutions favoring abolition of the tariff on lumber were tabled.

The following is an abstract of a paper by E. E. Russell Tratman, on Economy in Consumption of Railroad Timber: That railroads are responsible for a large amount of the timber consumed is an axiom. The present railroad mileage of the United States is 160,000 miles, which is increasing from 3,000 to 12,000 annually. Although no actual timber famine is yet imminent, still we have reached the point where economy in consumption is a necessary provision for the future. The redwood of California is being rapidly exhausted, and appears likely soon to be as rare as the buffalo on the plains. Redwood lands which a few years ago could have been bought for two or three dollars an acre, now command a dollar a thousand for stumpage, equivalent to $150 per acre. The waste of timber in the Adirondacks is appalling, and has been graphically treated in a recent series of articles in the New York *Times*. Waste in timber by railroads is not confined to this country, but prevails in India and South Africa as well as here.

Economy in consumption is to be practiced in two ways, both by substituting other materials for timber and by using preservative processes to lengthen the durability of timber, when used.

The greatest consumption of timber is for ties. Little has been done in this country in preservative processes, though creosote and zinc have been resorted to to some extent; but recent improvements in methods and materials render it probable that more will be done in preparing ties by some preservative process. In selecting the process, regard must be had to climatic and other conditions, since methods adapted to one locality might not answer in another. In Europe preserved ties are almost universally used, creosote being the usual agent, giving a life of 25 years to the ties. In this country creosoting is not desirable, because it softens the wood, a matter less important in Europe, because metal tie plates are universal. These protect the ties from the rail sinking into and ruining them long before decay sets in. Such tie plates should always be used in connection with wooden ties. Estimating 2,500 ties to the mile, there are in this country 400,000,000 ties. Averaging the life of the tie at eight years, the necessary annual supply for repairs is 50,000,000. Averaging the annual construction at 5,000 miles, many millions more are required for new construction. The use of zinc preservative processes, which harden the wood, and of metal tie plates to prevent the flange cutting into the tie, will effect a vast economy.

The other uses of wood were briefly reviewed.

The best means of promoting the ends for which the American Forestry Congress was organized is continued agitation, to impress upon legislators and people the vital importance of protecting the forests, and carefully husbanding their products.

THE SCRAP HEAP.

Notes.

The round-house of the Texas & Pacific, at Longview, Tex., was destroyed by fire last week, causing a loss of about $50,000.

At Mons, Belgium, Oct. 16, a passenger train running into a headhouse station became uncontrollable and was wrecked against the buffer stops, injuring 30 persons.

M. Koechlin, the engineer of the Eiffel Tower, has applied to the Swiss Bundesrath for a concession for the construction of a railroad to the summit of the Jungfrau Mountain, in the Swiss Alps.

Eighteen yard trainmen, the entire night force of the Wisconsin Central, at Chicago, struck Monday night. One of their number was discharged last week, and they demanded his reinstatement.

It is stated that the Grand Trunk has refused payment of any of the claims made on account of the victims of the train accident at St. George, Ont., last February, and that a dozen suits aggregating $280,000 have been entered in the courts against the company.

A supposed train robber was caught on a train of the Ohio & Mississippi one night recently in the act of uncoupling the rear car while the train was running near Bridgeport, Ill. The man claims to be innocent of any evil intent, but he had two accomplices on the roof of the car.

The St. Louis, Alton & Terre Haute took the officers of the Pennsylvania system (in their special train of five cars) last week from East St. Louis to Duquoin, 71 miles, in 92 minutes, stopping at three junctions and also for coal and water. The trainmen received presents of $5 each from the passengers.

The yard trainmen of the Louisville & Nashville, at Evansville, Ind., struck without warning on Oct. 21, demanding an increase of pay of 25 cents a day. Previous to quitting they bunched all the freight cars on the Union track and then removed the coupling pins. Over half a mile of track was covered with cars. New men were engaged.

The office of the Southern Express company, at Millsport, Ala., on the Georgia Pacific was robbed of $6,000 one night last week. While the agent was alone in office late at night, a man entered with a drawn revolver and made him hand over all the money in the safe. A desperado named Abercrombie, has been arrested and identified as the robber.

The New York *Herald* and other papers have lately printed long accounts of unusual sickness among the people of West Albany, N. Y., many of whom are employés in the shops of the New York Central. One account states that 400 persons have been stricken with fever, and that 40 men have died within a few weeks.

Yardmaster R. L. Denmark entered a freight car at the Atlantic Coast Line station in Wilmington, N. C., Monday night, carrying a lantern. Almost immediately a barrel of gasoline exploded, setting fire to the car and burning Denmark to death. It was not known that he was in the car until the flames had been extinguished.

The Richmond & West Point Terminal, Central of Georgia, East Tennessee, Virginia & Georgia, Louisville & Nashville, Southern Pacific and other South and Southwestern Railroads, and the Plant system of railroads and steamships, have united in a movement to make Tampa, Fla., the shiping point for all ocean freight handled on those lines. Extensive improvements of the Tampa Harbor, and new steamship lines to Mobile and New Orleans, are a part of the scheme.

The Bee Line Mutual Benefit Association held its twentieth annual meeting in Galion, O., last week. The report showed that during the year $20,500 had been disbursed in benefits—$19,000 in case of death of members, and the other $1,500 in disability cases. The old board of officers was elected. There are now 1,400 members, and it is expected that the membership will reach 2,500 before the next annual meeting by accessions from the new roads in the consolidated system

An Indianapolis report is to the effect that hundreds of persons are riding free in those street cars of that city which are not provided with conductors. A large number of conductors who were relieved from duty on the discontinuance of summer cars appealed to the public, and people are said to refuse to drop their fares into the box out of sympathy with the men making this appeal. The city attorney countenances this refusal by an opinion to the effect that the companies cannot compel passengers to go to the box and drop the money in.

An Incident of State Railroad Management.

A Canadian correspondent sends the following: "The provincial legislature of Nova Scotia has passed a franchise law depriving Intercolonial Railway employés of the privilege of voting either in provincial or civic elections. The Intercolonial is a Dominion Goverment road, and the employés all receive their appointments as political favors. The Nova Scotia Government, which is not of the same political stripe as the Dominion Government, has deemed it advisable to disfranchise these dangerous adversaries, which has raised a great howl throughout the province."

RAILROAD GAZETTE

Published Every Friday,
At 73 Broadway, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

One event in the history of the Pullman company during the past year deserves more prominent mention than is accorded to it in the report of the President. The "tourist" or second-class sleeping-car service, which was previously managed by many of our overland roads, has now, in general, passed into the hands of the Pullman company. The direct gain in net income is probably slight. Perhaps the change incidentally causes the company an expense which fully counterbalances the earnings from this source. But indirectly it is a decided gain. It stops the beginning of a practice which might have seriously interfered with the Pullman revenues. In times of active competition the tourist sleepers might readily be developed into an agency which should furnish the passengers so much comfort as to take away the inducements to travel on Pullman sleepers. If such a state of things lasted for any length of time, a road might learn to dispense with Pullman cars altogether. The purchase of the tourist sleepers by the Pullman company avoids this danger. It will prevent railroad wars from becoming an indirect source of danger to the company. If a railroad controls a part of its sleeping-car service, a war of rates always furnishes a possible menace to the profits of this traffic; but if Mr. Pullman controls the whole, the lower the rates the better for him.

Mr. Selden in his paper on car lighting by electricity, printed in another column, suggests that a system using a dynamo only, and no accumulators, could be used by keeping a lamp or a candle lighted in each coach to provide against the contingency of failure of the dynamo or connections. This would save the cost of the storage batteries and their weight, which even in the combined system, where accumulators are only auxiliaries, is 1,300 lbs. per car. We do not think that it would be good policy for any electric lighting company to rely upon or advocate such an expedient. The successful and acceptable electric lighting system must be one that is so reliable as to be entirely independent of lamps. Electric lighting will attract passengers not only because it is clean and handsome and gives brilliant illumination, but because it is safe. Kerosene lamps in the cars will some time be regarded as unclean, unsightly and malodorous, and they are now recognized as an element of danger. Their presence, along with electric lamps, will at once suggest the unreliability of electricity. They will look like an unworkmanlike expedient for patching up an imperfect system. For these reasons any system which retains them will be handicapped from the start, and almost certainly will not be able to compete with more complete electric systems. All of this applies also to car heating. We consider it an error to introduce into steam-heated cars any auxiliary heaters, except under very exceptional conditions. On the trains of the northern routes to the Pacific, for instance, it may be imprudent to try to do without them. We do not say that it is impracticable even now to light trains by dynamos alone without the introduction of storage batteries as accumulators of electrical energy, but merely that the electrical system which must be supplemented by lamps or candles will not be an acceptable solution of the problem now before electricians who aspire to enter the great and profitable field of train lighting. The use of storage batteries in connection with a dynamo is very frequently recommended by electrical engineers in locations where the continuance of the light is of less importance than it is upon a passenger train. Unless the entire plant is self-contained, and important parts duplicated for use in case of emergency, there appears to be no other method in the present state of the art than to utilize the storage battery, either as an auxiliary, a reserve, or as the main source of electrical energy. If the expense of such an arrangement is sufficient, in the judgment of railroad officers, to outweigh the safety and convenience of the electric system, they may be expected to use something more economical; yet, in entering the domain of luxury, as is frequently required by competition, the question of expense becomes secondary.

Mr. Selden makes another mistake in saying that the occupants of sleeping cars should not be encouraged to read or play poker. Of course, no one denies that gambling should be strictly suppressed; but we take it that Mr. Selden uses poker as a generic term for card playing in general, and reading and card playing are among the most agreeable and available means of killing time on a long railroad journey. Every one who has traveled much must remember dismal evenings when he has had to pass the hours from dark till bedtime in a car too dimly lighted for reading. When he has a choice between routes he will surely choose the one which is most likely to save him from another such experience. Where there is competition, the road which gives its passengers the most comfort will catch the business if other conditions are nearly equal, and where there is not direct competition most roads recognize the profit in pleasing their patrons. These matters are so well understood now that there is little danger of any intelligent management being misled by the heretical doctrine that it is not desirable to furnish light enough to read by.

The railroad telegraph superintendents have before them a wide field, virtually the whole range of electrical matters. Most roads have no officer any better equipped for becoming an electrical expert than the telegraph superintendent, and if he shows himself capable of taking charge of all matters of this kind he ought to be able to convince the directors of the wisdom of enlarging his sphere. The Association is to be congratulated on such an intelligent and painstaking collector of facts as Mr. Selden, and it is to be hoped that it will have many more papers of the quality of his. This paper, though taking considerable space in our columns, was not the only feature of the meeting, and the reader should not omit the rest of the report. The phonoplex seems to have proved its usefulness for railroad work, and the ingenious instrument for enabling way stations to keep their telegraph instruments adjusted in all weathers deserves to be classed with charity, for it will cover a multitude of sins—or at least cuss words. This device is in use on the New York, Lake Erie & Western, Baltimore & Ohio, Lehigh Valley, New York & New England, Fitchburg, Old Colony, and Chesapeake & Ohio, and is a very simple device. We hope to illustrate it at an early date.

The paper in another column on adhesion and rack railroads contains information valuable to those who are interested in the construction of mountain railroads, and the conclusions with regard to adhesion of locomotives with water, with sand, and with the bare rail are interesting, but do not agree closely with the results of such experiments made upon more level roads. The lack of adhesion of locomotive drivers in tunnels is pointed out, but the statement that sand is of little value in such places is rather surprising. It is there stated, and has been before concluded by other authorities, that a jet of water forced upon the rails, thereby cleaning them, is more advantageous than sand, yet it has not been proved that if the sand be washed off the rail behind the driver the resistance of the train will not be considerably decreased and the sanding of the tracks made more advantageous than the use of water. In most cases where sand is used it would not be difficult to believe that the additional rolling friction caused by the presence of sand on the rail to some extent offsets the gain in tractive power brought about by its use under the driving wheels. In the next to the last paragraph the following appears with reference to the construction of mountain railroads: "As soon, therefore, as this fact has been acknowledged, which has been proved in practice, or, in other words, as soon as the conviction has been arrived at that if traffic is to be regular, safe and economical an adhesion railroad may not be constructed with such daring gradients as a rack railroad, then it will be seen that a line of the latter type must form beyond dispute the shortest route by which to connect any two given points at considerable elevation above the sea." We had supposed that this conclusion was reached years ago, and that there could be no question that a rack railroad could be used where an adhesion railroad would be impossible. The last paragraph clearly shows the value of line a careful consideration of the most suitable cost per for mountain railroads. The enormous mile for such roads and the advantages of rack railroads to reduce the length of the line are two features of the problem that considerably reduce the number of feasible schemes to be compared, and from which the best one may be selected; and it often happens that the use of a short, steep grade and a rack will save large sums of money in construction. In Switzerland, where rack railroads are numerous, this problem has received much attention, and the paper in question is a rehearsal of the conclusions drawn from the experience there obtained. In the mechanical construction of rack railroads, there has been much advance in late years. The racks, rails, roadbed and locomotives have all been greatly improved. Iron sleepers are now to a considerable extent used, being tied together by a continuous iron band, in addition to the rails. The racks are now made of wrought-iron and steel channels into which are inserted wrought-iron teeth, properly shaped. The locomotives are supplied with the Le Chatelier brake and other devices newer and equally good for stopping the trains and lowering them down the incline. By means of these, the noise of the operation of the machinery has been much decreased and the safety of the trains considerably enhanced.

The autumn rush of freight is now so widespread as to warrant the statement that it is universal. Coal, coke and iron men in Western Pennsylvania and Ohio have complained of shortage of cars for many weeks, and this scarcity is reported at a number of points as having affected the price of commodities. Pittsburgh dispatches this week instance a rise of 75 cents to $1 a ton on coke, of which amount a considerable portion is attributed, even by conservative men, to the lack of cars. Coke, however, is a commodity which has depended more completely than almost any other on cars for a part of its storage, or at least for a method of service which shall take the place of storage. A Chicago reporter has visited all the roads in that city, and counts up the shortage of cars by tens of thousands. Pittsburgh and Chicago are only examples of the situation at hundreds of smaller places. The Pennsylvania is only hauling about 40 per cent. of its coal orders, and the Philadelphia & Reading about 50 per cent. The only reason why lake shipments of coal this year will not exceed those of last year is the lack of cars. In the midst of these reports it is somewhat amusing to learn from the Chicago dispatches, whose life has come to depend upon rate disturbances, that railroad men are "greatly excited" over alleged cutting of rates by which corn from Nebraska is going east through Cincinnati (to Newport. News and Baltimore), as was the case several months ago, when the Baltimore & Ohio secured a big haul in Nebraska by ways that seemed dark to the other fellows. The Chicago reporter naïvely adds that the Chicago roads are powerless to meet the cut (by throwing away their own profits) because they have not the cars to take the freight. This is truly sad. It is a pity that the car-service associations are not now everywhere equipped and ready for business, as one great obstacle to their success—the fear that a weak competitor will secretly relax the rules—is now at its minimum, and decided progress ought to be possible. A per diem charge for interchange is, at such a time as this, more necessary than ever. It is annoying to labor under a great shortage of cars, when one must daily submit to the spectacle of hundreds of his own cars on foreign lines out of his reach; and the contrast between the futile attempts of the traveling car hunter to get cars home by talking or tracing, and the business-like certainty of a system which automatically sends cars home, should now appeal strongly to every operating officer.

The law of fellow-servants and the liability of the employer for injuries to men whose relations to each other are not always easily defined, as included in or

excluded from this class, are the subject of interesting decisions printed in our Railroad Law column this week. The civil engineer in the thirteenth decision probably won his suit largely because he had been ordered to the wreck. If he had gone under mere general instructions, or simply from a desire to be useful in an emergency—which probably would have been commendable—his case might have come out differently; and yet the company's negligence in having a reckless runner would have been unaltered. Whether a runner is reckless, or is merely guilty of poor judgment, is a delicate question; but probably most managers would gladly give the benefit of any doubt to an innocent employé riding on the train in a case like this, if the men were not so prone to placing their interests in the hands of shyster lawyers at the first opportunity, which is generally about two hours after an accident. Instances of the very foolish claims that advocates will sometimes make are shown in cases 11 and 12, and a question of tax assessments, which seem to afford perennial food for the legal department of railroads, is the subject of decision No. 2.

Reorganization of the American Society of Civil Engineers.

The present condition of the American Society of Civil Engineers is certainly not critical. Its membership increases from year to year: its financial condition is prosperous; its prestige does not wane, and it is still recognized at home and abroad as the one society of American civil engineers which can pretend to be a national society. Should the Committee on Revision of the Constitution fail to recommend definite action this year or should the Society decline to make any change in its organization and its fundamental law, either at the next annual meeting or at the next convention, an earthquake is not likely to take place. The federation of the local societies into another great and really national society will not be accomplished at once, even if the American Society declines to take the lead in such a federation now. But failure to take the lead now will make it harder to take it by and by, and such a federation is pretty sure to be attempted before long, and will probably succeed sooner or later. It may be very soon. The American Society may foresee it and lead it, or may ignore it. In the first event the American Society, with its name and its traditions, will simply absorb the great body of engineers and expand into the national society, with unquestioned and unrivaled pre-eminence. In the second event there will ultimately be two societies struggling for supremacy. We sincerely hope the first will happen, and we think it will. There is, however, a queer misconception of the significance of the present agitation. This is illustrated in some letters which have lately appeared in the *Engineering and Building Record*. One writer says, "as the members of the Cincinnati Association advance in professional attainment, and, by reason of connection with larger works, gradually become residents of New York, they will find themselves undergoing a marked change of view on this point. As Mr. Hobbs has it, they 'won't object to being earls themselves.'" Another writer speaks of the "Western sentiment that 'the society is now in a corner,'" and thinks that "the society cannot be allowed to become a gypsy encampment." He holds that, as the resident members pay larger dues than the non-resident, they should have more to say in the management of the society, and, in conclusion, he says:

> Let the independent clubs in the several cities be entirely independent and work off their surplus energy in the management of their organizations, and contribute from experience thus gained a wider and wiser criticism of the management of the national organization.

The movement to so change the organization of the society as to make it more useful and attractive to men living at a distance from the city of New York, which has found definite expression in the revision of the constitution proposed by the Cincinnati members, has its origin in no such puerile motive as jealousy of the "earls" in New York. The talk of "ring rule" is but a trifling element in the matter. There are few who would wish to restrict or diminish in any way the privileges which the resident members enjoy. There is no important body of engineers in the West or in the East, either among the members or of those who are not members, who say or think that the society is "in a corner," or who would do anything to put it there. If the movement for reorganization drew its strength from such ignoble sources it would not be worth while to waste breath upon it. It would die of inanition. This notion of the force back of the movement is one of the misconceptions which find expression in words like those quoted above. Another misconception is that so much of the flower of the profession is centred in and about New York that it is not very important whether or not the men "in the provinces" are satisfied with the present condition of the society. This notion is very apparent between the lines quoted.

Now, the broad facts are these: Only a part of the number of the ablest and most eminent engineers are gathered in and about New York City. In other great cities, east and west, are found many of the men of national reputation. The engineers of Boston, Philadelphia, Chicago, Cincinnati and St. Louis are not merely men of local and provincial reputation. Among them, as well as in New York, are found "world engineers," whose field of work extends all over the land. Throughout the breadth of the country are scattered the men who are daily adding to the knowledge and achievement of the profession. A large number of these men are already members of the American Society of Civil Engineers. Many are not, but should be. Few of these men feel that the object of membership in the American Society is accomplished when they have acquired the right to pay their dues, receive the *Transactions* and write M. Am. Soc. C. E. after their names. Most of them wish the further privilege of meeting frequently with other members of the society; reading, hearing and discussing with and before those members papers of professional interest, and having their papers and discussions go out to the profession under the name of the great national engineering society. It has been pointed out that there is not the slightest reason why members of the society should not get together in any city and read and discuss papers, and then send them to the society at New York. True, there is no reason; but their doings would be merely informal, and would have no more official place in the Transactions of the society than the doings of any individual. They would still have to go through the routine of presentation at a regular meeting of the society at New York or at the annual convention before their publication could even be considered. Any one who will take the trouble to look at the quantity of material now produced by the local societies will see at once that it would be impracticable to again present it and discuss it with any thoroughness at the meetings in New York. There is not time. Doubtless any member of any one local society or chapter of the American Society would be glad to have his paper discussed by every other society or chapter before its final publication; but he does not wish to be compelled to wait for its discussion by a body meeting in a distant city, where he cannot be present, before it can be treated as a part of the proceedings of the society.

In brief, the one great object to be sought in the reorganization of the American Society is a federation of certain of the best engineering societies. To this object all other changes in the constitution should be subordinate. But in this federation all the societies, the American as well as those having having their seats in half a dozen cities outside of New York, must stand upon the same footing. Probably it would be the wish of all that the name of the American Society of Civil Engineers should be retained, and, doubtless, the best and prevailing sentiment is opposed to any lowering of the standard of full membership. Otherwise the independent organizations will have to be approached on equal terms before they will consent to merge themselves into the larger society.

It is not proposed to discuss here the details of the reorganization. The aim has been merely to present the broad question as it must be understood before it can be finally settled.

The Pennsylvania Rules.

The article on the Pennsylvania's new book of rules, which is printed in another column of this issue, deserves the attention of all railroad superintendents who are interested in careful work in this department and desire to maintain a high standard in the train and station service of their own roads. The excellent and exhaustive work done on this subject by the Time Convention committee has been repeatedly alluded to in these columns heretofore. An equally careful committee has now gone over the same ground, and we have here the result of its work. Most of the alterations are such as would be made by a careful manager for his own road, even if he were a member of the convention committee himself.

The alterations, while in very few instances radical, are so numerous and interesting that we cannot stop to call attention to them individually. Each reader should take a copy of the standard code and carefully follow the list throughout. One or two points, however, deserve special mention. That an engineman is a trainman seems a most reasonable conclusion, and that a switchman is a switch-tender and nothing else is equally sensible. The use of this term as an appellation for men employed upon trains doing yard work, which seems to be most common in the West, especially in the region of Chicago, is unfortunate. The alteration in Rule 19 seems to be somewhat in the nature of hair-splitting. If extreme accuracy is desired, why not say, "The list of times given . . . constitutes a schedule." The note on Rule 37 illustrates the difficulty of showing in a book for your own road the differences between it and the standard code in all particulars. The necessity of many of the corrections is perfectly obvious, and would hardly be worth speaking of, except that we wish to show them as a contrast to the less careful work done in adopting the standard code on some other roads. We cannot see why Rule 48 should not be worded so as to apply to classes, the same as has been done with 101 and 102. Rule 91a seems to impose a needless requirement, and one which will be very likely to be violated, in making no exception to the 1,800 ft. rule in clear weather on a straight track. Rule 97 is good, but why should the flagman *go* 900 yards? Why not go far enough to make the signal *visible* at a point 900 yards off and thus preserve the principle governing the previous portion of the rule?

The correction in Rule 99 is good from a radical standpoint; but, after all, its practical value is at least questionable. The new rendering is possibly a shade poorer than the old, in that the language is slightly less forcible. It will be observed that this rule has not been modified so as to include the requirement that a flag shall be sent back whenever a train begins to seriously lose time, which has recently come into prominence by reason of a bad collision from its violation. The Pennsylvania lines which are not protected by the block system may not for many years afford an opportunity for a brakeman to follow the dangerous example set at Palatine Bridge, and the difficulty of formulating a satisfactory rule on this point is so great that we do not now criticise the Pennsylvania's omission; but that here is a point where danger will always lurk until the matter is taken up and settled should be borne in mind by all. The amendment to 108, intended to meet an objection which was recently brought out by a correspondent in these columns, is exceedingly neat. Seldom do we see a single word used with more force. Notwithstanding this, we still think this rule affords an illustration of the necessity of sometimes foregoing the advantages of brevity for the sake of making sure that the men understand what is required. The change in 110 cannot be regarded as a great improvement, and that in 111 is of doubtful value. Rule 114 is very good, but we suppose it must be modified by many exceptions on the important divisions, especially where there are four tracks.

The rules between the two parts of the standard code should be of almost equal interest, in their sphere, with the uniform rules, for the Pennsylvania has given more care than almost any other road to these rules. That is to say, its work upon them has been carefully done, and was begun several years before most other roads took the matter up. The salient feature in this department is brevity. While covering perhaps as many points as the average of the best codes, the language is very comprehensive and details are almost entirely eliminated. There are two ways of looking at this. Every one knows that men have to be instructed in great detail, and that codes much fuller than the Pennsylvania's fall far short of being a complete guide to the trainman and station man; and as long as the average code is so poorly understood, it is perhaps just as well to leave out all but the briefest essentials. But as men must be instructed, and the work needs to be done with care, why not have it done with the aid of a printed manual? There may be a question whether minute details should be embodied in a book like the one before us, but as to their being printed in some form there should be no question.

The block signal rules are very clear and simple, and the Pennsylvania sets a good example, which some other roads that have ostensibly "followed the Pennsylvania plan" would do well to look at again. It will be observed that the practice of giving three different indications with a semaphore still obtains on the Pennsylvania. As many semaphores, in interlocking and elsewhere, are now habitually dropped only to about 45 degrees to indicate "all clear," a marked inconsistency is here perpetuated, and so long as it exists the tendency among engineers to a confusion of "caution" and "all clear," is only a natural sequence.

Our readers will recollect that we gave a synopsis of the work done by the Erie in adapting the standard code. The matter will be found in the numbers for Feb. 17 and Feb. 24, 1888, pages 102 and 124, and affords some interesting comparisons with the Pennsyl-

vania book. The Erie spaces passenger trains ten minutes, the Pennsylvania five. Erie rule 102a is noteworthy.

Whistles and Bells.

Certain residents of New York near the freight yards of the New York Central & Hudson River road have convinced the City Board of Health that wooden clappers ought to be used in the bells of the yard engines running near their residences in order to abate the noise to a reasonable limit. Some people in Cleveland have complained to the newspapers that the engines of the Lake Shore & Michigan Southern are allowed to whistle too much and too loudly. The superintendent of the latter road says that if his dissatisfied neighbors will bring their evidence to him they shall receive satisfaction, his rules being fully as strict as those promulgated by the municipal authorities. What the New York Central officers think of the novel proposition concerning their bells we have not heard. These two instances are merely samples of a feeling which is all the time cropping out, at one place or another, and which keeps alive a never-ending conflict, of a more or less mild character, between railroad officers and the public. It is to be remarked in passing that it would seem on the surface no more than reasonable that a railroad should know of itself what its employés are doing, and that, therefore, if the reply given to the Cleveland people should result in adding to their ill-feeling rather than mollifying it, the outcome would be nothing more than should be expected. To ask resident abutters to tell us how well our men are obeying the rules seems a trifle absurd.

But one of the most significant facts in this connection is that whenever noisy practices on railroads are materially abated, the officers and the trainmen, as well as other people, are sure to be pleased with the change. Such changes have generally been made under compulsion, or, at least, the initiative has generally been taken by the city or some body outside the railroad; but the superintendent who does not feel gratified, personally, at having his yard work done more quietly than is customary in this country we have yet to find. A realization of this fact ought, it would seem, to lead more superintendents to take active measures in this line without waiting to be prodded. Another important point to be remembered in this matter is that an offensive whistle is just as annoying to the residents of a small hamlet in the country as to the more numerous, but perhaps not more irritable, residents along a railroad track in a city. In union is strength, and the latter class secure their rights by combining. The solitary farmer whose house may, unfortunately, be located where a hundred engineers whistle for two highway crossings every day, and sound the whistle 100 per cent. too long and too loudly each time, is virtually compelled to submit because of the inconvenience of asserting his rights.

There are a number of points to be attended to in curing this nuisance, both in the bell and in the whistle. The superintendent who avails himself of his legal privilege to omit the whistle at certain highway crossings, naturally desires a loud and sonorous bell, at least on his road engines. If the bell is the only warning to wayfarers it should be an effective one. On engines used exclusively in yards the bell might be considerably lighter and yet fully serve its legitimate purposes. A light bell, with the ordinary metal tongue, would seem to be a more reasonable modification than the wooden clapper proposed by the New Yorkers. Whether a bell is light or heavy, and whether its parts are made of metal, or of wood, or of old shoes, it should be rung by a person who is intelligent enough to have some care for the feelings of residents. Whistles are troublesome because they are very loud and often of unpleasant tone, because they are sounded too often and too long at a time, and because they are not kept in good order. The screeching affairs in use on some roads have no excuse for existence. And it is a question whether many whistles of soft, resonant and agreeable tone are not larger than is necessary. A whistle should be loud enough to be readily heard by the rear brakeman of a long freight train above the noise of the cars. It must be admitted that to do this the whistle, if of pleasing tone, must be of a size which can readily be made an instrument of torture by any engineer who may see fit to do so and is not prevented. The question, therefore, of obviating complaints of residents is not to be met by the use of small whistles. The chime-whistle, so-called, gives such a modified and usually agreeable sound that its general use would no doubt meet the objections of many nervous people; but whether it is as readily distinguishable as a simple tone at the tail-end of a 50-car train moving rapidly, we are not prepared to say. No conclusive experiments on this point have come to our knowledge. The ordinary whistle can, however, be greatly improved and can be made tolerable in the great majority of cases. To work well, a whistle must be centered carefully on the stem which holds it, and the aperture in the bowl below it must be properly located. A weak and slender stem is liable to be broken by the vibrations and becomes easily bent. The valve and the connection to the pull rope in the cab should be so adjusted that pulling the whistle wide open and shutting it quickly can both be done with perfect ease. The high, piercing and very disagreeable notes often emitted by whistles which normally give a low tone are entirely unnecessary, and whether they result from the bell being out of its proper position, from a defective valve or any other cause, they should be forbidden and the enginemen held to account.

Obviously, an important part of the remedy for unsatisfactory whistling lies in the discipline of the engineers. They should not only keep their whistles in order but should be taught not to use the whistle as a plaything nor to be constantly trying to produce the greatest possible variety of sounds which one whistle is capable of. They must be taught that "a short blast" means one of one second or less, and that a "long" one should be three or four seconds, and not eight or ten. Those who have not a natural ear for time must be made, if possible, to see that four blasts of the most various lengths do not properly represent the highway-crossing signal, which should be two blasts of about one-half second each, followed by two, occupying less than one-half second for both of them.

But, after all, the principal thing is to materially lessen the number of places at which a whistle signal is required, and to enforce the rule forbidding its unnecessary use in yards. Why should the steam whistle be used at all in ordinary yard work where a mouth whistle, to be used by the men, would answer all purposes? Certain New England roads, notably the Boston & Albany and the Old Colony, have materially lessened the whistling at highway crossings on their roads, and the former, especially, sets an example which ought to be followed very widely. Its rule requires the bell to be rung at all highway crossings, but the whistle is not sounded where there is a flagman or gateman, and in the night, when wagon travel is light, it may be omitted at all crossings, provided the headlight burns brightly. The rule is suspended whenever there is a dense fog or a severe snowstorm. The laws of both Massachusetts and New York give this discretion to all roads, but there is a practical difficulty in the way which seems to scare most of them out of taking advantage of the discretion allowed. While it is perfectly lawful to run trains at any speed over a grade crossing without giving the whistle signal, it is true that however slowly a train may be running and however faithfully the bell may be rung, the first absent-minded countryman who blunders upon the track and suffers injury, either to himself or his wagon, will demand high damages and will succeed in convincing a jury that he ought to have had a very much louder warning. After a few such juries have mulcted a company for large sums the superintendent concludes that he will leave no more room for doubt, and forthwith orders the whistling to be more loudly and more faithfully performed than ever before. We think, however, that the effect of these verdicts is allowed to have too much influence. The Boston & Albany has had no cause for special complaint, the verdicts against it not being perceptibly greater or more numerous than under former conditions. And even if a road does suffer from this injustice, is it not a duty incumbent upon the management and one of the inevitable drawbacks which must be regarded as a necessary incident of running a railroad in a free country, to fight such verdicts and thereby endeavor to enlighten public sentiment? Certainly the people who reside near railroads and are annoyed by excessive whistling, even where the loudness of it is not objectionable, *per se*, are much more numerous than the class who see fit to take no care of their own lives when traveling on the highway, and expect the railroad to assume not only its own responsibility, but theirs also.

A Remarkable Experiment with Passenger Tariffs.

Last July we gave an account of the new passenger tariff devised for the Hungarian State Railroads. On the 1st of August it went into effect. We are now able to give more detailed information concerning it, and especially the opinion of the Traffic Manager of the system as to the results. This tariff is not only new but novel, having, we believe, no precedent in the history of transportation, at least on any considerable system of lines. We repeat, therefore, something of what was said in the former issue to make this article the more complete.

Regular passenger rates in Hungary have been high. The country has, for an agricultural country of its area, a large population and a small railroad mileage, conditions which we are accustomed to look at as most favorable for yielding a large passenger income. But while Hungary has 15¾ millions of inhabitants on an area about as great as Illinois and Missouri together, and only about 5,000 miles of railroad, the 3,000 people per mile of railroad, which is more than seven times the average in the United States, have given a very unsatisfactory passenger traffic. The population consists very largely of extremely poor peasantry, whose expenses must be limited to the barest necessities of life; and there are comparatively few manufacturing industries.

The management of the state railroads has heretofore sedulously cultivated the passenger traffic. While the ordinary fares have been higher than in most European countries, attempts have been made to meet the special wants of the population by means of commutation and mileage tickets, and the like. The use of these tickets at reduced rates was sufficient to show that there was a public which would travel at low rates and would not at the regular rates; but the mass of the population continued to neglect the railroad, and long journeys among the lower classes were very infrequent. The average yearly number of railroad journeys per head of population was scarcely one in Hungary, while in Austria it was more than two, and in Germany five.

The means by which it is hoped to induce these stay-at-home people to travel is a "zone" tariff for the longer distances, and what we may call a "vicinity" tariff for local travel. The latter consists of two tickets only—tickets to the "next" station, which are sold at the uniform prices (whatever the distance to such "next" station) of 10, 15 and 30 kreutzers each for the three classes respectively, or a little less than 5, 7½ and 15 cents; and tickets to the "second" station at 15, 22 and 40 kreutzers (7½, 11 and 20 cents). These two patterns of local tickets serve for the whole state system. There are on these railroads stopping places distinguished from regular stations—signal stations, perhaps we might call them. A ticket for the "next" station, however, is good for the whole distance between two regular stations, and for all halting places short of the second regular station, while a ticket for a "second" station is good for all stopping places short of the third regular station.

The "zone" tariff for longer distances gives only 14 rates of all possible distances on the railroad system by ordinary trains, and as many for express trains. In the first zone are included all stations within 25 kilometres (15½ miles) of the place from which the start is made, for which the rates are 50, 40 and 25 kreutzers (about half as many cents, remember). Each following zone up to and including the eleventh adds 15 kilometres to the distance and 50, 40 or 25 kreutzers to the fare, according to the class, so that so far the zone tariff is substantially a distance tariff, roughly evened off. The twelfth zone is for 175 to 200 kilometres, with the addition to the fare the same as before; the thirteenth zone shows a similar addition to distance, but greater additions to fares—100 kreutzers for first class, and 50 for both second and third—but the fourteenth is the startling feature of the whole system, for if you travel more than the 225 kilometres (140 miles), which is the extreme of the thirteenth zone, you are charged 100 kreutzers more for the first class and 50 kreutzers more for the second or third classes *for any distance*, from a single kilometre up to the greatest on which it is possible to travel on the Hungarian state railroads, on which routes several hundred miles long can be made. That is, in Hungary, the greatest distance for which the traveler is charged is 141 miles. For this or any greater distance his fare is $2 third class, $2.90 second and $4 first, by ordinary trains, and $2.40, $3.50 and $4.80 by express trains.

Hungary is not a large country; its greatest length from east to west is hardly 500 miles, and from north to south about a third less. It is not, therefore, quite as if you could travel from New York to New Orleans, or St. Paul, or San Francisco on any ticket bought for Albany or Baltimore, or Elmira, or a similar distance. But the effect of the new system is similar; that is, it gives a premium, as it were, on long-distance travel—or what in Hungary is considered long-distance travel, which with the great bulk of the population can hardly be said to exist there now, and which the authorities appear to desire to cultivate. Perhaps not solely for economical reasons. The population is anything but homogeneous. Little more than half are Magyars, or Hungarians proper, and the great bulk of the remainder belong to various and very different Slav races, with strong prejudices, the masses of each living quite isolated, with just about enough intercourse with the other races under the same rule to hate them cordially. Possibly they would get along together more harmoniously if they knew each other better; but probably industries which would bring them together in search of employment would be more effective than cheap fares, or rather cheap fares without the industries are not likely to have much effect.

There is one very peculiar limitation to the new Hungarian zone tariff. If a journey is made through Buda-Pesth, the capital, charges are made for two zones, one on each side of that city. Suppose the distance is 600 kilometres, 300 on one side and 300 on the other side of that city; instead of paying for a ticket for the fourteenth zone, which is good for any distance, you must pay for two such tickets. Imagine such a provision in this country; that you could travel any distance for five dollars, but if you went by way of Chicago you would have to pay that sum on each side of that city. It is easy to see what the result would be. All passengers from places east of Chicago to places west of it would go by way of Indianapolis, Peoria, Joliet, etc., and thus save half their fares. But the Hungarian rule was not made to

hurt Buda-Pesth by any means. The only way to get from the railroads on one side of it to those on the other side is through it; so the chief effect of the rule is likely to be to very greatly limit the number of long journeys that can be made on a fourteenth-zone ticket. It is near the centre of the railroad system, though far west of the centre of the Hungarian territory. Under the circumstances the provision is likely to be, and it is acknowledged that it was intended to be, beneficial to Buda-Pesth, by making it cheaper to go there than to places in adjacent countries. But for it, we may imagine that Vienna would profit more by the new tariff than any Hungarian city. Vienna is but a short distance from the border, and if the passenger could go from the remotest corner of Hungary to the border for as little as to Buda-Pesth Hungarians must be unlike other people or a very large part of them would go to the big city to trade rather than to the little city. We invite the attention of soulless corporations which have a pet city to build up to this plan.

Two railroads not belonging to the state system have also adopted this tariff system; but each line has its zones by itself, so that a long fourteenth-zone ride cannot be got by running from a state line upon a company's line, or *vice versa*.

With the introduction of this tariff the allowance of free baggage is abolished; but a reduction in the old charges for extra baggage is made, and the charges are made for three "zones" only—for distances of 50 kilometres (31 miles) or less; for 50 to 100 kilometres, and for all distances above 100 kilometres. For *every piece* of baggage weighing 50 kilogrammes (110 lbs.) or less, the charges are 25, 50 and 100 kreutzers, respectively, for the three zones; in connection with which we may observe that while we pay 25 cents for our trunk for 31 miles, for 32 miles we pay 50 cents, and only as much for 500 miles. For a piece of baggage weighing more than 50 kilos., up to 100, you pay double; for any heavier piece, *quadruple*; this latter being doubtless a fine for encumbering the train with anything weighing more than 220 lbs., which baggagemen, outside of Hungary, would like to have imposed. One of the advantages claimed for this system is that in the great majority of cases it will make it unnecessary to weigh the baggage, a practice almost universal in Continental Europe, and one which makes a vexatious demand on the time of the passenger; in some places the rules requiring that the trunks be presented at least 15 minutes before train time.

The whole Hungarian tariff can be presented in a very small table, as follows:

Distance.	Fares in kreutzers.					
	Ordinary trains.			Fast trains.		
	Class.			Class.		
	1.	2.	3.	1.	2.	3.
To 1st station	30	15	10	....	....	....
To 2d station	40	22	15	....	....	....
1st zone, up to 15½ miles	50	40	25	60	50	30
2d zone, 16 to 25 miles	100	80	50	120	100	60
3d zone, 26 to 34 miles	150	120	75	180	150	90
4th zone 34 to 43½ miles	200	160	100	240	200	120
5th zone, 44 to 53 miles	250	200	125	300	250	150
6th zone, 54 to 62 miles	300	240	150	360	300	180
7th zone, 63 to 71 miles	350	280	175	420	350	210
8th zone, 72 to 81 miles	400	320	200	480	400	240
9th zone, 82 to 90 miles	450	360	225	540	450	270
10th zone, 91 to 100 miles	500	400	250	600	500	300
11th zone, 101 to 109 miles	550	440	275	650	550	330
12th zone, 110 to 124 miles	600	480	300	710	600	360
13th zone, 125 to 140 miles	700	530	350	840	650	420
14th zone, 141 and more miles	800	580	400	960	700	480

The par value of the kreutzer is 0.48 cent.

These rates are a very great reduction from the former regular rates. A Hungarian newspaper gives the old rates from Buda-Pesth to the following point, as under:

Buda-Pesth to	Class.		
	1	2	3
Kaschau	16.40	11.50	8.20
Grosswardein	14.90	10.40	7.40
Klausenburg	24.10	16.90	12.00
Kronstadt	42.10	28.90	19.20
Arad	15.40	10.80	7.70
Semlin	19.90	13.70	9.10
Agram	22.70	16.70	11.40
Fiume	37.10	27.80	18.60

All of which are now superseded by the fourteenth zone rates of 8.00, 5.80 and 4.00 guldens. Kronstadt is in the extreme eastern part of the kingdom, close to the Rumanian border, and this is the longest journey, doubtless, that can be made under the new tariff. The old fare to this place was about five times as great as the present one. To Vienna the new rates from Buda-Pesth are 9.00, 6.80 and 4.50 gulden, against 10.50, 7.50 and 5.50. The route for about one-sixth of the distance is in Austria.

Among shorter distances than those of the fourteenth zone the reductions are still considerable. Thus, for a route 55 miles long the fares go down from 5.30, 3.70 and 2.70 to 3.00, 2.40 and 1.50, and for 95 miles from 9.30, 6.50 and 4.60 to 5.00, 4.00 and 3.50. The old rates were about 4½ cents per mile first class and 2¼ third; for this particular shorter distance they are now about 2½ cents first class, one-fifth less second and one-half less fourth. Thus, aside from the novelties of the tariff, there is a great reduction, and the tariff, as a whole, is probably one of the lowest in the world. If there was much long-distance travel it would be decidedly the lowest.

With the introduction of the new tariff all of the old reduced-rate tariffs, such as round-trip, mileage and commutation tickets, are abolished, with the single exception that "next station" and "second station" tickets are sold from Buda-Pesth in books of 30 and 50 at a reduction of 5 and 10 per cent., and a reduction of 50 per cent. will continue to be granted on the fares of parties of agricultural and other laborers traveling in search of work.

The Traffic Manager of the Hungarian State Railroad, wrote Aug. 27 to a German railroad journal, which had criticised the new "zone" passenger tariff, that the result down to that time had been favorable beyond expectation. Exact figures were not then attainable, but it was evident that the traffic had about doubled, compared with last year, and that about half of the increase was due to the "vicinity" tickets (tickets to the first and second stations). Even the gross passenger earnings were decidedly larger than the year before, and whatever falling off there might be later, it was evident to him that the serious financial loss that some had prophesied would not be realized.

It was to be expected that the travel at first would be unusually active, as those who had journeys to make would postpone them if possible until the new tariff (announced long beforehand) should take effect. The reports of travel for a longer period are, therefore, looked for with great interest.

On Oct. 16 a bare quorum (fourteen) of the Finance Committee appointed by Mayor Grant to arrange the details of the World's Fair in New York, 1892, held a meeting, and resolved that in future seven members should constitute a quorum of the committee. They also appointed a sub-committee to determine the form of subscription lists to the guarantee fund, and decided that the $200,000 for contingent expenses should be raised by contributions from the General Committee, this being an assessment of a little over $500 from each member. The sub-committee held numerous meetings, and took legal advice, with the object of elaborating a plan which should bind the subscribers under certain conditions, and at the same time limit the liability of each contributor to an amount represented by his subscription. On Oct. 21, the form of subscription blanks was approved, and orders were given for the preparation and circulation of subscription books. The call for subscriptions states that certain persons who are named desire to form a corporation for the purpose of celebrating the four hundredth anniversary of the discovery of America "by the holding of an international exposition" The conditions under which subscriptions are invited may be summarized as follows:

(1) Subscriptions not to be binding until Congress authorizes the exhibition in New York, and state and national charters have been obtained. (2) No subscription to be binding until at least $5,000,000 is subscribed. (3) Subscriptions to be payable in four installments, at intervals of not less than three months. Certificates of stock to be issued to subscribers, entitling them to share in all funds and assets after the exhibition closes and all expenses are paid. (4) Liability of subscribers to be limited to the extent of their subscriptions. (5) Money subscribed to be used only for purposes of the exhibition. (6). Calls for payment of subscriptions to be made on not less than ten days' notice, by mail. (7) All stipulations in this agreement to be dependent upon the action of a majority of the proposed incorporators. Vacancies in the membership of the incorporators to be filled by the vote of the remaining members. Mr. Roswell P. Flower, who has lately made a tour of the South, reports that influential persons in that region are favorably disposed toward New York, but are waiting to see which city will raise the largest guarantee fund.

In Chicago, committees embracing the different trades and professions have been organized to raise funds and influence public opinion. Mr. E. L. Corthell, Chairman of the Committee of Civil and Mechanical Engineers, has addressed a circular to members of his profession asking their co-operation, setting forth the peculiar advantages of Chicago, and announcing that "It is proposed that during the Exposition a great Engineering Convention, embracing all branches of engineering, be held here, to which will be invited the entire membership of every engineering organization in the world."

An attempt was made to wreck a passenger train on the Chicago, Burlington & Northern near Maiden Rock, Wis., on the night of Oct. 17, by piling sleepers upon the track. Some steamboat men discovered the obstruction before any harm was done. A heavy timber was placed in a culvert on the Chicago, Rock Island & Pacific near McFarland, Kan., Oct. 20, and it was struck by a passenger train, but the sleepers which held it in position yielded enough to prevent derailment. An attempt was made to wreck a train on the Alabama Midland last Saturday night. Just above Lapine, Ala., on a rather steep grade, two iron rails were placed on the track, but the engine knocked them off the track. The pay car was on the train. These are samples of items found in our exchanges every week. We do not print them all, for the reason that it is often difficult to separate the facts from the opinions. Some of the detectives who have investigated numerous cases of this kind believe that a large majority of the reports are based on hasty conclusions, and that the real causes are accidental rather than malicious; and *Puck* has recently published a pictorial commentary on the subject in the shape of a cut showing tramps piling sleepers on the track, followed by a second one showing one of the tramps flagging the train, and a third depicting the grateful passengers filling the tramp's hat with $5 gold pieces. But notwithstanding the opinions here illustrated, instances of the work of real devils in various forms of train wrecking are numerous enough to keep superintendents on the alert and give them anxiety. The chances of such crimes must suggest to every superintendent that he should not only have his divisional officers employ a sufficient force of special agents to keep well posted concerning what is going on along the line of the road, but should do what he can to keep local magistrates and constables posted, so that when action is necessary there shall be no lack of vigor on the part of those officers.

The value of a good speed recorder was testified to in a peculiar manner by a recent experience on a road where there are 75 these instruments. There is one Wythe recorder in every caboose. Freight trainmen are required to keep them constantly in use, and all trains are limited strictly to 18 miles an hour. The graphic record made by this machine is sent to the superintendent's office every day and all the records are carefully examined by an officer called "inspector of cabooses." This man's other duties embrace an oversight of the signals and other appliances carried in cabooses, the degree of care with which neatness is maintained, etc. One day not long ago it was discovered that the stock of ruled paper for use in the speed recorders had unexpectedly run out and a new supply had to be ordered by telegraph. From various delays in getting the paper, the use of the instruments had to be suspended for about a week, and during this time there were three quite expensive rear collisions, whereas the speed regulation had been so well obeyed before that no collision of consequence, from fast running, had occurred on the road for several years. This incident furnishes good presumptive evidence not only of the care with which the superintendent has watched the men to see how faithfully they carried out this regulation, but also of the impracticability of tampering with the instrument. It is hardly to be expected that a body of 50 conductors should not include at least one or two who would be actuated by that impatient and cunning disposition which delights in trickery and deception, even where there is no great personal advantage in it, and an example of such a successful solution of this old problem of speed regulation seems worthy of note.

A pamphlet setting out in detail the organization of the Signal Department of the Pennsylvania lines west of Pittsburgh was issued from the office of the General Manager, to take effect Aug. 1. The principles of signaling, diagrams illustrating their application, and specifications for the construction and placing of signals are given with much elaboration, and, so far as we have been able to see, with a just appreciation of the principles. One very noticeable and significant provision is this: "Illuminated arms shall be used in all new work and renewals." This, taken with the other provision that all semaphore signals shall be painted *yellow* on the face, indicates an intention to eventually abandon color entirely, both for night and day signals, and to rely upon form and position only. The caution signal is distinguished by its forked end only. It is said that "these positions (horizontal for danger or caution, and at 60 degrees with the horizon for safety) may be indicated by illuminating the arms, or by colored lights —red for danger, green for caution, white for safety." It will be observed that the illuminated blade or the colored lights are given as alternatives. A possible inference from the language of the pamphlet is that the forked blade for caution must be designed to show its form by illumination as well as its position.

The use of roller bearings to reduce the friction of all kinds of trucks and vehicles pushed by hand about railroad shops is increasing. The Chicago & Northwestern has just applied a set of those bearings of very simple form to one of its transfer tables, with a marked reduction in the amount of power required to push it. One man now does the work of about five. The simplicity of the design and the low cost render the step a most advisable one, and those who are now having trouble with trolley trucks for conveying castings or heavy work about shops, or with any bearings on machines which, although heavily loaded, have to be moved by hand, would do well to consider the feasibility of adopting some of the many simple forms of roller bearings. The successful use of such devices on transfers, capstans, turning-tables, cranes and other portions of railroad equipment, particularly in the West, furnishes sufficient precedent and guaranty of their satisfactory operation when they are properly arranged.

An article in the *Journal des Transports* gives interesting figures of the average annual locomotive performance in different countries. The list is as follows:

	Miles.
United States	22,720
New South Wales	20,490
India	19,730
Great Britain	18,520
France	16,890
Italy	15,210
Belgium	12,790
Germany	11,940
Austria	11,9.0

In comparisons like this, countries with long lines and comparatively sparse traffic have a relative advantage. It is much to the credit of Great Britain that she is able to maintain so high an average in spite of these adverse circumstances. The low German average is the more inexplicable on account of their good utilization of other portions of their equipment.

The cars in the two elegant new trains of the Shore Line between New York and Boston, while not vestibuled, so closely resemble vestibuled cars of the now familiar pattern, that half the passengers, we venture to say, will not notice the difference. The frame work of a vestibule, without the doors, is there, the general plan being similar to that employed on the cars of the fast mail trains in providing a protection to the men in lugging bags from one car to another. The vertical posts at the sides of the buffer (which is as wide as in the ordinary vestibule) have no connection with their

counterparts on the adjoining car, but the hand rails and brake wheels are of brass and of the same highly ornamental pattern seen on vestibule cars, and gates of this pattern take the place of the side and end doors. As far as safety is concerned this arrangement is an almost perfect substitute for the inclosed way and the weather-proof connection, but in heavy rain or high wind there will be a difference.

Although the new standard axle of the Master Car Builders' Association has a collar, there is a strong liking for axles without collars, and it is certain that before long steps will be taken to introduce on two roads at least a standard collarless axle. One case has come to notice where, after long-continued service, satisfactory results have been obtained from collarless axles used on trucks without end frames, and without special preparation for keeping them in rectangular form. One of the arguments advanced by those in favor of the use of collarless axles on the ordinary truck is that less trouble will be experienced from skew trucks if they have a certain degree of flexibility than if they are made rigid, and therefore when deflected laterally remain rigidly out of square.

About a week ago Judge Cooley went to his home in Ann Arbor to rest and restore his health, which is said be considerably impaired. Every one who has any conception of the work that he has done in the last two years and a half must wonder that his strength has endured so long and must hope for his speedy restoration. While we have not always been able to approve of the Commissioners' interpretation and administration of the Inter-state Commerce law, we have felt from the first that it was fortunate for the railroads and for the nation that the head of the Commission was a man so able, so wise and so upright as Judge Cooley. All who realize the immense responsibilities of the position must watch with solicitude any signs of failure of his health.

The following resolution was passed at the recent meeting of the directors of the Northern Pacific. It is so creditable to the directors and so wise as a matter of policy that it is a little sermon in itself:

"*Resolved*, That unlimited leave of absence be granted to Secretary Wilkeson, with full payment of his salary of $4,000 a year, and with the privilege of doing as much or as little work as he pleases, and that he accept the affectionate injunction of the directors of the company he has served so well, that he use this leave of absence unstintedly so as to improve his health and prolong his life."

The *Zeitung des Vereins Deutscher Eisenbahnverwaltungen* devotes more than three pages to an article advocating a system of passenger fares based on time of transit instead of distance. The author would have each passenger buy a set of stamps like mileage coupons, each one of which would authorize him to travel ten minutes. We are reminded of the feelings of the Vermonter who bought a ticket from New York to Albany by the limited express, but objected to the price, saying that "in Vermont a man could ride all day for that much money."

The contract for nine miles of the Lake street elevated road in Chicago has at last been placed, and work is to be begun at once. Messrs. Cofrode & Saylor have the contract, and have, it is said, leased the rolling mills of the Philadelphia & Reading Coal & Iron Company at Reading and will put them at work on the material for the structure.

NEW PUBLICATIONS.

A Treatise on Steam Boilers. By Robert Wilson, C. E. Enlarged and Illustrated from the Fifth English Edition by J. J. Flather, Ph. B. New York: John Wiley & Sons, 1888. 12mo, 473 pp. Price, $2.50.

Mr. Wilson's treatise has been so long before the public and is so favorably known that there is little need of further comment. The additions by the American editor comprise illustrated descriptions of prominent types of boilers used in the United States, remarks on riveting, bracing, safety valves and other boiler details, setting boilers, combustion, boiler explosions and rules for testing boilers, the latter being a copy of the code established by a committee of the American Society of Mechanical Engineers.

The Engineering and Building Record appeared last week in a brilliant red cover, and is enlarged by the four pages which the cover makes. The improvement has been under consideration for a considerable time, and as the current volume closes with the last issue for November, it seemed best to make it now. The cover is strikingly distinctive and very handsome.

Journal of the Association of Engineering Societies. The October issue contains an important and elaborately illustrated article on Clearing Water by Settlement, by James A. Seddon. The other papers are Memoirs of Mr. Henry C. Moore and Mr. William S. Barbour, and a paper by Mr. Samuel McElroy, on the Croton Valley Storage.

The *Street Railway Journal* shows much enterprise in issuing a daily bulletin at Minneapolis, Minn., during the session of the Convention of the American Street Railway Association. The bulletin comprises 40 pages printed on excellent paper, and contains a description of the exhibits, many "personals," and a report of the session.

TECHNICAL.

Locomotive Building.

The Rhode Island Locomotive Works have received an order for 10 mogul locomotives for the Kansas City, Fort Scott & Gulf.

The Cleveland, Cincinnati, Chicago & St. Louis will begin receiving next week the new engines recently ordered, 10 of which will be ten-wheelers for hauling heavy passenger or freight trains. They will have 5-ft. driving wheels, 19 × 24 in. cylinders, and a boiler 58 in. in diameter. Five other engines will be six-wheel switching engines.

The Central of Georgia will receive this week 10 mogul and three switching engines from the Dickson Manufacturing Co. of Scranton, Pa.

Car Notes.

The Union Pacific has been asking for bids on 1,000 box cars.

Armour & Co., of Chicago, are having 100 refrigerator cars built at the Pullman Car Works, at Pullman.

The Indianapolis Car Works have been awarded the contract to build 900 coal cars for the Pittsburgh & Western. Two hundred of these cars are to be delivered within 30 days and the rest by Feb. 1, 1890.

The St. Charles Car Co., of St. Charles, Mo., this week shipped eight cabooses for the Rio Grande Western and four cabooses for the Mexican Central.

It is reported that the Grand Trunk intends building 2,000 more freight cars for its Western divisions.

The Great Northwest Central has purchased three heavy locomotives and 50 platform and 50 box freight cars, which have been sent through to Brandon, Man.

The Southern Iron Car Line, of Atlanta, Ga., has recently leased 500 fruit cars to the Central of Georgia, and 500 fruit cars to the Nashville, Chattanooga & St. Louis. E. C. Spalding, Gate City National Bank, Atlanta, is General Manager.

The London Liability Co. has offered the Harrisburg Car Co. $500,000 for the entire plant; $400,000 to be in cash and the balance in debenture bonds. The Manager has addressed a letter to the stockholders asking their wishes in the matter.

The East Louisiana Railroad has built at its shops in New Orleans some freight cars with passenger trucks, Miller platforms and couplers, air brakes and air signals. They can carry 45 bales of uncompressed cotton.

It is stated that the Philadelphia & Reading has invited bids for 3,500 coal cars, and it is expected that the orders will be placed this week.

The Harris Palatial Car Co. is having a car built at the Wason shops, Brightwood, Mass.

The Pullman Car Works last week turned out two more vestibule trains, one, a day, the other a night train, to be run between Chicago and Cincinnati over the Louisville, New Albany & Chicago and Cincinnati, Hamilton & Dayton roads. The business men of Indianapolis, Dayton and Cincinnati were invited to take a trip with the cars before they were put in regular service.

Bridge Notes.

E. H. Parent, Superintendent Engineer of Canals, is preparing estimates for the cost of a proposed bridge, 500 ft. long, extending from the foot of McGill street, Montreal, Quebec, across the canal locks.

The Iron City Bridge Co. has secured the contract for the erection of a new rapid transit bridge, to take the place of the old structure at Ninth street, in Pittsburgh, over the Allegheny River. The work on the structure must be finished by March 1. The bridge will be 60 ft. wide, with four tracks, and will have sidewalks on either side 10 ft. wide.

Plans and specifications for an iron truss bridge across Jim River at Yankton, Dak., are being prepared by the City Engineer. The bridge is to have one span of 280 ft., resting at either end upon cylinders sunk 16 or 18 ft. into the earth. It will be 16 ft. high with a roadway 18 ft. wide and it is estimated will cost $12,000.

Cofrode & Saylor, of Pottstown, Pa., have leased the Philadelphia & Reading rail mill at Reading, Pa. The Carpenter Steel Co., which has been occupying a part of the mill for experimental purposes, has been notified to quit within 70 days, and immediately after that company vacates the mill will be changed for the manufacture of structural iron.

Plans are being made for a viaduct to cost $45,000 and to span the Union Pacific tracks, separating North and South Cheyenne, Wyo.

The Secretary of War has affirmed his rejection of the plans proposed for the new bridge across the Missouri River at Kansas City within a mile of the mouth of the Kansas River, authorized by act of Congress of Oct. 22, 1888. This was based upon the fact that the location selected was not in accordance with the terms of the act.

The City Council of Minneapolis has awarded the contract for the construction of the railroad bridge on Burr street for $3,389, and Rheaume & St. Pierre the contract for the viaduct over the Chicago, Milwaukee & St. Paul, on Grand avenue, for $2,790. A resolution was passed asking the city engineer to prepare plans for the superstructure for a high bridge at Broadway, and authorizing the issuance of 4 per cent. 20 year bonds to the amount of $150,000, to defray the expenses of the construction of the piers and foundations for the bridge.

Bridges are projected at the following places: Oswego, N. Y.; Fullerton, Neb.; Danville, Ill.; Waldron, Ill.; Bay City, Mich.; Grand Isle, Vt.; Fairview, Ill., and Calvert, Kan.

The County Court of Claims has passed an appropriation of $10,000 for a county bridge, to be built across the Cumberland River above Pineville, Ky.

The Dominion government has replaced five of the old wooden bridges of the Prince Edward Island road with new iron structures this year.

The Phenix Bridge Co. has the contract for the superstructure of the Hamilton avenue bridge, at North Kingstown, R. I. It is a truss bridge, with a 105 ft. span, 20 ft. roadway and two side-walks, each 5 ft. wide.

The contract for the superstructure of the bridge over the Greenbrier River, at Fort Spring, Md., has been awarded to the Pittsburgh Bridge Co.

Manufacturing and Business.

The steam tug "Lorne," recently built by the Albion Iron Works, Victoria, British Columbia, developed a speed of 14 knots on her trial trip. Her engine is of the triple expansion type, and said to be the largest marine engine ever constructed in the Dominion.

The Rotary Snow Shovel Manufacturing Co has just completed a rotary snow shovel for the Minneapolis & St. Louis.

The R. B. Stone Lumber Co., of Chicago, made an assignment this week with liabilities of $81,500 and nominal assets of $89,000

The De-oxidized Metal Co., of Bridgeport, Conn., is at present casting huge rings of acid-resisting metal, each ring forming a section of a bisulphate digester for pulp mills. These rings are 9 ft. 10 ft. in diameter, and weigh 9,760 lbs. each. The company is also casting cylinders 16 ft. 4 in. long for the cruiser "Maine," and has orders for a large amount of smaller work for the Pullman Co. and other car builders.

The Dickson Mfg. Co., of Scranton, Pa., has ready for shipment a wheel 54 ft. high, and weighing 200 tons, probably the largest piece of mechanism of its kind in the world. It was built for the Calumet Mining Co., of Lake Superior, Mich., to be used in hoisting waste sand to a certain height, so as to allow the refuse matter to be dumped into the lake.

The Davidson Steam Pump Co., 77 Liberty street, New York, report the shipment of 26 direct-action steam pumps to the Risdon Iron & Locomotive Works, San Francisco, Cal. This makes a total of 63 of these machines that have been sent to the Pacific Coast during the past three months.

Mr. Wm. G. Robinson, No. 66 Broadway, New York, reports that the portable stop block, or "chock," for locking cars on sidings or elsewhere, which was illustrated in the *Railroad Gazette*, April 19, 1889, has already come into general use upon the following roads among others: Pennsylvania; Boston & Albany; New York, New Haven & Hartford; Ulster & Delaware; New York & New England; Long Island; Lehigh Valley; Brooklyn & Brighton Beach; Kings County; Brooklyn Elevated; South Atlantic & Ohio; Lackawanna Iron & Coal Co. and Starin Transportation Co.

Mr. Julio M. Foster, President of the North and South American Construction Co., is now prepared to correspond with manufacturers for supplying all necessary materials for the building and equipment, except rails, for the road being built by the company in Chili.

The partnership heretofore existing under the name of Whittlesey & Wright, patent law attorneys, wherein Geo. P. Whittlesey of Washington, and D. Pratt Wright, of Berkeley Springs, W. Va., were co-partners, has been dissolved by mutual consent. The affairs of the firm will be adjusted, and the business continued, by George P. Whittlesey, who was for six years in the examining corps and interference division, United States Patent Office, and who has had an experience of ten years in patent cases.

A 30-foot Ridgway crane, built by Craig Ridgway & Son, Coatesville, Pa., is being put into the new extension of the plate mill of the Catasauqua Mfg. Co., of Catasauqua, Pa. A crane of the same design is also to be used to handle the cinder of the blast-furnace of Wm. Neal & Sons, at Bloomsburg, Pa., which is now undergoing extensive repairs.

We hear that two new tin plate works are projected at Llansamlet, one near Gwernllwynchwyth, and the other near Llwyncrwn, on the site of the old complex ore work. We hope the Gwern.., etc., people will not introduce the name of that place into their business address; the Ynispenllwych Tin Plate Co. was bad enough, but Gwernllwyncnwyth would be unutterably worse.—*Iron & Steel Trades Journal* (London).

Iron and Steel.

The Phœnix Iron Co., of Phœnixville, Pa., has begun the erection of a plant for annealing eye-bars. They will be handled from cars in and out of the furnace by two Ridgway cranes, the use of which will reduce the force required to two men.

Thompson C. Gill & Co., of Philadelphia, have bought the entire works of the Camden Tool & Tube Works, which they will dismantle and then dispose of the machinery.

The Glasgow Furnace Co. has been organized to build an iron furnace at the new town of Glasgow, Va. One hundred thousand dollars of the capital stock have been subscribed for by the Rockbridge Co.

One of the furnaces of the Coplay Iron Co., Limited, at Coplay, Pa., has been blown out for relining and repairs. It will be ready for blast again about Nov. 1, next. The other stack of the firm is in successful operation.

The Salem Furnace Co. has given the contract for a 100-ton coke iron furnace to the American Bridge Co., of Roanoke. The company will purchase the Tower property near Salem, containing 2,700 acres, and will open iron mines.

Four new puddling furnaces are being built at the Sable Iron Works of Zug & Co., Limited, at Pittsburgh. When finished the mill will have 38 single puddling furnaces in its two departments.

The West Superior Iron & Steel Co., of West Superior, contemplates the erection of a blast furnace as an addition to its plant, which now consists of a large foundry building, with auxiliary structures, such as boiler house, etc. The foundry building is 72 ft. wide by 360 ft. long, with heavy brick walls and the roof supported by iron trusses designed to withstand the strain of radial cranes. This foundry is being fitted up to manufacture cast-iron pipe and will not be started on pipes until January, but will be used for special work earlier. The foundations for the furnace stack have already been prepared, and the size of the furnace will be 18 × 80 ft. The company has in view the gradual expansion of the plant into works for the manufacture of steel as well as pig iron.

The previous greatest single day's output of the Homestead Steel Works was recently surpassed. The five-ton converters averaged nearly three heats per hour, representing about 700 tons for the day. The open-hearth department turned out several 1,800-lb. ingots. Armor plates weighing 1,800 lbs. have been turned out without a flaw. At the Edgar Thomson Works at Braddock also a record of 1,080 tons of finished steel rails was recently made—the greatest single day's output.

Extensive works are being erected at Walkerville, Ont., for the manufacture of malleable iron. The company expects to employ 200 men.

The Rail Market.

Steel Rails.—A sale of 20,000 tons to the New York Central & Hudson River road is the only large sale reported. The market is quiet both east and west, and several inquiries for delivery in December and January have been received. It is estimated that the sales already made for 1890 delivery aggregate about 750,000 tons. The quotations at Eastern mills are $31.50@$32; at Pittsburgh, $33.50 on cars at mill, and at Chicago standard sections are held at $34@$35.

Old Rails.—A number of inquiries for large lots for long delivery are in the market, but no sales of large quantities are reported. The market is firm, with quotations in the East for tees nominally $24.50@$25. The quotations at Pittsburgh for old iron rails are $26.50@$27, with sales at $26.75@$27, delivered at mill in the Mahoning Valley. Old steel rails are quoted at $22 for short pieces. At Chicago the quotations for the latter are $19@$20, and old iron rails are held at $25.25@$25.50, some holders refusing $26.

Track Fastenings.—Some large orders are pending, and eastern quotations for steel angle bars continue at $1.95@$2, delivered, cheaper than iron. Spikes are $2.20@$2.25 delivered.

Souder's Grain-Dumping and Merchandise Car.

The Lehigh Valley has in service one of J. J. Souder's hopper-bottom cars for carrying grain, merchandise or coal. It is a box car, and a section of the flooring can be lifted up and forms the grain doors, while the opening in the floor discloses the hopper. The dog windlass is on the side of the car.

The Louisville & Jeffersonville Bridge.

We are informed that the contract for the substructure for this bridge has been let to Sooy Smith & Co., of New York. The full contract was awarded to the Phœnix Bridge Co. The length of spans and, consequently, the position of the river piers has not yet been determined.

Electric Train Lighting.

The Midland Railway of England is now running three trains lighted by electricity, one a short train, in which the cars are always coupled, and two main line trains which are made and broken up on the way. In all three trains the dynamo is in the guard's van and driven from an axle. In the short train 85 lamps are run from one set of accumulators placed in the guard's van. In the main line trains each car has a set of accumulators which are charged from the dynamo. One train has the batteries in series and the other in parallel; the latter appears to be the more promising arrangement. Both trains afford a very satisfactory light, and are broken at various points and set together on the return journeys without interfering with traffic arrangements. The lights are of eight candle-power each, two to each compartment. They can be turned up or down, and if a car becomes detached they are automatically lighted. The couplings and general arrangements were devised by the Telegraph Department and are covered by patents. Although the work is still regarded as experimental, an experience of four months has induced the company to extend it, and two new trains are being fitted up.

New Shops and Stations.

It is proposed to shortly establish extensive works at St. Hyacinthe, Quebec, for manufacturing locomotives. The promoters are C. Roy & Co., a firm of iron and foundrymen of Belgium. The City Council will give the firm a subsidy of $50,000 and a free site for the erection of the works, which will give employment to 400 men.

Contracts for the erection of 14 stations on the Canadian Pacific, between London and Windsor, Ont., have been awarded, the work to be completed in January next.

Mica for Lubrication.

We have received the following extracts from reports made by Mr. T. C. Chase of trials of the mica lubricant, which is now made by the New Mexico Mica Mining Co., of Denver. The mica is ground by the cyclone pulverizer to great fineness, and is used with very little or no oil.

"On April 26 I packed engine No. 422, of the Rock Island, at Horton, Kan. She ran an average of 100 miles per day for three weeks without repacking, and at the end of that time was in first-class condition, having run about 2,000 miles altogether. The company oils every 200 miles. I also packed four other engines for the same road, with equally good results. On May 5 I packed one truck on a baggage and passenger car; these each ran 2,800 miles without additional oiling. The remaining trucks on the cars were oiled by the railroad company every other day, or on an average of once every 400 miles. On arriving at Horton I presented Mr. Wilson, the Master Mechanic, with a sample of dry mica. Shortly afterward an engine came in with her eccentric stuck. After loosening it up and applying some dry mica, with oil, she made the balance of her run on time, and reached her destination in good condition.

"On June 8 I went to Omaha, to make a trial on the Union Pacific road. I packed one chair car, having new journals and brasses; she ran from Omaha to Ogden, about 1,000 miles, without additional oiling. After using a small quantity of dope at Ogden, the car made the return trip to Omaha without more attention. At Omaha more dope was added, and the car made the round trip without oiling.

"On June 21 I left Denver on the Fort Worth road, after having packed a baggage and passenger car with the 'Denver lubricant.' These cars made the round trip between Denver and Fort Worth twice without using any additional dope. The passenger car, through a mistake of the employés of the road, was oiled at one station, after making 2,200 miles. The baggage car ran 3,200 miles with but one oiling.

"I was afforded every facility for a thorough test by the different roads, and will say that the wonderful record made by the 'Denver lubricant' in comparison with oils and greases now used by them has never been excelled."

The Coteau Bridge.

On Feb. 1 the Canada Atlantic expects to have its new steel truss bridge spanning the St. Lawrence River at Coteau opened for traffic. The bridge, including intervening islands, is nearly 1¾ miles long from shore to shore, and will cost $1,500,000 when completed. There are 17 fixed spans; one of 139 ft., two of 175 ft. each, ten of 217 ft. each, and four of 223 ft. each, the swing over the north channel covering 355 ft. over all. The islands are, Giroux island, 905 ft. wide, and Round Island, 1,220 ft. The approach to the bridge on the north side commences two miles from the water's edge, a gradual rise, and reaches an elevation of 22 ft., from which the bridge continues in a dead level and perfectly straight line. The southern approach commences about 2,500 ft. from the water's edge, and rises at a grade of about 30 ft. to the mile, until within 700 feet of the river, when it runs level with the bridge. The maximum depth of water in which the piers stand is 28 ft., in the north channel, and the minimum 24 ft. The piers are 46½ by 10 ft. at the base, and 24 by 8 ft. at the top. They are built on solid rock bottom in nearly every case. There is concrete to the depth of 12 ft., and the rest is all limestone, each block dowelled its entire length to the next block beneath, and the cut-water is clad with steel plates. The contractors are: The Dominion Bridge Co. for the superstructure; Messrs. Neelon, McMahon & Co., St. Catharines, Ont., for the stone work in the north channel, and James King, of Valleyfield, for the stone work in the south channel. The latter furnishes Caughnawaga and the former Apple Hill stone, and although both are of limestone samples, the Caughnawaga stone has a grayish and the other a yellowish hue. The original charter was granted in 1872 for a bridge with an 80-ft. draw. In 1876 the government, on account of the opposition raised to the obstruction of the river, would not allow the bridge to be built, although the company agreed to give a 200 ft. draw, opened by steam in two minutes and by hand in three minutes. A compromise was finally arrived at and tenders were called for, the project having fallen into the hands of the Canada Atlantic.

A New Steamer for the Ward Line.

The steel steamship "Yumuri," built for Ward's line, between New York and Cuba, was launched at Roach's shipyard, Chester, Pa., on Oct. 12. The vessel is 320 ft. long, 43 ft. beam, 21 ft. deep, and has a displacement of 3 300 tons. The construction is in accordance with the specifications of the United States Standard American Steamship Owners, carrying a rating of "A1, 20 years." There are three decks, including hurricane deck, the main deck being of steel. The engines and boilers are inclosed by bulkheads, and all the houses are on the main deck. The "Yumuri" is schooner rigged, with steel masts. Triple-expansion engines, of 2,600 H. P., are fitted, and there are six boilers, with corrugated furnaces of the Scotch type, designed for a working pressure of 160 lbs. per sq. in. The estimated speed is 16 knots an hour. The steamer is to be lighted by electricity. There are accommodations for 84 first-class and 27 steerage passengers. A tank in the fore peak, for carrying oil to be used in storms, is something of an innovation.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Baltimore & Ohio, Washington Branch, 5 per cent., payable Nov. 1.

Northern New Hampshire, 3 per cent., payable Nov. 1.

Seaboard & Roanoke, 5 per cent., payable Nov. 1.

Wheeling & Lake Erie, 1 per cent., on preferred stock, payable Nov. 15.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Atchison, Topeka & Santa Fe, special, Topeka, Kan., Nov. 7.

Buffalo, Rochester & Pittsburgh, annual, Rochester, N. Y., Nov. 18.

Cleveland, Cincinnati, Chicago & St. Louis, annual, Cincinnati, Oct. 30.

Central Massachusetts, annual, Boston, Mass., Oct. 30.

East Tennessee, Virginia & Georgia, annual, Nov. 20.

Knoxville Belt, special meeting at Knoxville, Tenn., Nov. 2, for the purpose of acting upon a proposed mortgage.

Lake Erie, Essex & Detroit River, special, Windsor, Ont., Oct. 29, to consider a proposed mortgage.

Manhattan, annual, New York City, Nov. 13.

Montgomery, Tuskaloosa & Memphis, special meeting, Montgomery, Ala., Nov. 18, to vote on a proposed increase of the capital stock.

New York, Lake Erie & Western, annual, 21 Cortlandt street, New York City, Nov. 26.

New York, Pennsylvania & Ohio, annual, Cleveland, O., Nov. 9.

Ontario, Carbondale & Scranton, special, Scranton, Pa., to consider a proposed mortgage to secure an issue of $1,500,000 bonds.

Oregon & Transcontinental Co., special meeting, Portland, Or., Nov. 5, to take action on the question, which has already been submitted to the directors, whether the capital of the company shall be reduced or the company shall be liquidated and go out of existence.

Philadelphia, Germantown & Norristown, annual, Philadelphia, Pa., Nov. 4

St. Lawrence & Adirondack, special meeting, Salaberry, Que., Oct. 29.

Southwest Pennsylvania, special, Philadelphia, Pa., Nov. 14.

Tennessee Midland, annual, Memphis, Tenn., Dec. 4.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *New England Railroad Club* meets at its rooms in the United States Hotel, Beach street, Boston, on the second Wednesday of each month, except June, July and August.

The *Western Railway Club* holds regular meetings on the third Tuesday in each month, except June, July and August, at its rooms in the Phenix Building, Jackson street, Chicago, at 2 p. m.

The *New York Railroad Club* meets at its rooms, 113 Liberty street, New York City, at 7:30 p.m., on the third Thursday in each month.

The *Central Railway Club* meets at the Tifft House, Buffalo, the fourth Wednesday of January, March, May, August and October.

The *American Society of Civil Engineers* holds its regular meeting on the first and third Wednesday in each month at the House of the Society, 127 East Twenty-third street, New York.

The *Boston Society of Civil Engineers* holds its regular meetings at Boston, at 7:30 p. m., on the third Wednesday in each month. The next meeting will probably be held at the United States Hotel.

The *Western Society of Engineers* holds its regular meetings at its hall, No. 67 Washington street, Chicago, at 7:30 p. m., on the first Tuesday in each month.

The *Engineers' Club of St. Louis* holds regular meetings in St. Louis on the first and third Wednesdays in each month.

The *Engineers' Club of Philadelphia* holds regular meetings at the house of the Club, 1,122 Gerard street, Philadelphia.

The *Engineers' Society of Western Pennsylvania* holds regular meetings on the third Tuesday in each month, at 7:30 p.m., at its rooms in the Penn Building, Pittsburgh, Pa.

The *Engineers' Club of Cincinnati* holds its regular meetings at the Club rooms, No. 24 West Fourth street, Cincinnati, at 8 p. m., on the fourth Thursday of each month.

The *Engineers' Club of Kansas City* meets at Kansas City, Mo., on the first Monday in each month.

The *Civil Engineers' Society of St. Paul* meets at St. Paul, Minn., on the first Monday in each month.

The *Montana Society of Civil Engineers* meets at Helena, Mont., at 7:30 p. m., on the third Saturday in each month.

The *Civil Engineers' Club of Kansas* holds regular meetings on the first Wednesday in each month at Wichita, Kan.

Engineers' Club of Cleveland.

A regular meeting was held Oct. 8. A committee consisting of Messrs. W. H. Searles, John Whitelaw and A. Mordecai was appointed to confer with a similar committee of the American Society of Civil Engineers, with a view to co-operation in technical work. Mr. J. H. Dow read a paper entitled Notes on a New Compound Steam Turbine, which was discussed. Mr. N. S. Possons read a paper on Electric Motors as Applied to the Propulsion of Street Cars, which was also carefully discussed.

PERSONAL.

—Mr. S. H. Bass, General Freight and Passenger Agent of the Mexican National, has resigned.

—Mr. George W. Hibbard has resigned as Assistant General Freight and Passenger Agent of the Mexican Central, and has returned to the United States.

—Mr. I. L. Overton, Superintendent of Bridges and Buildings on the Missouri Pacific, died suddenly in Holden, Mo., Oct. 13, of neuralgia of the heart, aged 63 years.

—Mr. Isham Randolph, C. E., has been appointed Western agent of the National Switch & Signal Co., of Easton, Pa., with office at Room 42, Chicago, Rock Island & Pacific Depot, Chicago.

—Mr. William Hunter, formerly Engineer of Maintenance of Way of the Atlanta & West Point, has been appointed Chief Engineer of Maintenance of Way of the Central of Georgia system.

—Mr. Jared E. Redfield, President of the Little Rock, Mississippi River & Texas road, part of the St. Louis, Iron Mountain & Southern system, and largely interested in other railroads, died at his home in Essex, Conn., Oct. 20, aged 65 years.

—Mr. Simon Cameron Long has been promoted to be Assistant Engineer of the Philadelphia, Wilmington & Baltimore, with headquarters at Dover, Del. Mr. Long was formerly Supervisor of the Pennsylvania, between Columbia and Coatesville, Pa.

—Mr. Richard Gray, General Freight Agent of the Southern Pacific, has been appointed General Traffic Manager of the company, to succeed Mr. J. C. Stubbs, who resigned last week to become Second Vice-President of the Chicago, Milwaukee & St. Paul, in charge of traffic matters.

—At a meeting of the directors of the Western Railway of Alabama, in Atlanta, Oct. 22, Mr. Cecil Gabbett resigned as President of the company, and Charles Phinizy, of Augusta, was elected in his stead. Mr. Gabbett resigned because of increased duties as General Manager of the Central of Georgia.

—Mr. Walston H. Brown has been elected President of the Cincinnati, Jackson & Mackinaw road to succeed Mr. J. H. Fisher, resigned. Mr. Brown is a member of the banking firm of W. H. Brown & Co., of New York, and is President of the Buffalo, Rochester & Pittsburgh, and is largely interested in many other railroads in this country.

—Mr. W. A. Lutes, who has been Superintendent of Bridges and Buildings of the Southern Pacific at New Orleans for five years, has resigned that position to accept the office of Superintendent of the Bankers and Merchants' Bridge Co., of St. Louis, Mo. Before leaving New Orleans Mr. Lutes was banqueted by the Southern Pacific employés, and presented with a handsome gold watch.

—Mr. W. H. Newman, late Third Vice-President of the Missouri Pacific, has been chosen Second Vice-President of the Chicago & Northwestern. He will have charge of traffic matters, succeeding Mr. H. C. Wicker, General Traffic Manager, who recently resigned. The office of General Traffic Manager will be abolished. Mr. Newman resigned from the Missouri Pacific last June, and has since been traveling through the United States, visiting Alaska, the Northwestern states, New England and Canada.

—Mr. J. M. Culp, General Freight Agent of the Louisville & Nashville, was married last week to Miss Juliet B. Edmonds, of Louisville. They were the recipients from Mr. Culp's railroad friends of very valuable presents. The employés of the Louisville division sent a number of beautiful silver pieces. The Memphis division sent them an exquisitely carved sideboard "that of itself was a thing of beauty." The outside was covered with the handsomest cut-glass, and the inside was crowded with all the expensive and handsome china it could hold. The Montgomery division sent a gorgeous hand-carved bed-room set, made to order in New York City.

— Mr. E. B. Phillips, President of the Fitchburg, has resigned on account of ill-health. He has been President of the Fitchburg since Nov. 1, 1883, and has been in railroad service half a century, his first position being on the Boston & Worcester as freight receiver. He was promoted till he became Superintendent and has since been Superintendent of the Cleveland & Toledo, President of the Michigan Southern & Northern Indiana, President of the Lake Shore & Michigan Southern, President of the Phillips & Colby Construction Co. (builders of the Wisconsin Central), Receiver of the Grayville & Mattoon, President of the Eastern and also of the Toledo, Cincinnati & St. Louis, and then President of the Fitchburg.

ELECTIONS AND APPOINTMENTS.

Astoria & South Coast.—At the recent annual meeting in Astoria, Wash., the following directors were elected: F. J. Taylor, C. W. Fulton, A. Kinney, Wm. Reid, F. W. Conn, C. H. Page, I. W. Case, D. K. Warren and E. P. Thompson.

Atchison, Topeka & Santa Fe.—K. H. Wade has been appointed General Manager of the California Central and California Southern roads, with headquarters at Los Angeles, Cal., to succeed D. McCool, resigned. J. Hanley has been appointed Freight Traffic Manager, and W. F. White, who has been Traffic Manager, has been made Passenger Traffic Manager. F. C. Gay, General Freight Agent of the Chicago, Santa Fe & California, has been appointed General Freight Agent of the Atchison, Topeka & Santa Fe, in place of C. A. Parker, with headquarters in Topeka, Kan. J. D. Springer has been appointed Assistant to the President. All except Mr. Wade and Mr. Gay have headquarters in Chicago.

Augusta & West Florida.—The following are the officers of this company: C. E. Smith, President, No. 3 Warren Block, Augusta, Ga.; A. P. Wright, Vice-President, Thomasville, Ga., and H. L. Sturdivant, Chief Engineer, Augusta, Ga.

Ava, Grand Tower & Cairo.—The incorporators and first board of directors of this Illinois company are: Johnston Husband, W. E. Tallott, Whitney Gilbrath, Don E. Detrich, J. Connor and S. H. Douglas, all of Ava, Jackson County, Ill.

Belleville, Zanesville & Cincinnati.—J. W. Gregg, Master Mechanic, having resigned to take service with another company, V. B. Stubbins has been appointed Foreman of Shops. Engineers, firemen and car-repairers on the line will be under the orders of W. T. Lyle, Superintendent.

Chesapeake & Ohio.—The annual meeting of the stockholders of the company was held in Richmond, Va., Oct. 22. The stockholders elected the following board of directors: W. P. Anderson, M. E. Ingalls, Cincinnati; George T. Bliss, C. H. Coster, C. D. Dickey, Jr., C. P. Huntington, Ex. Norton, George S. Scott, Samuel Spencer, A. J. Thomas, New York, and H. T. Wyckham, Richmond.

Chicago, Milwaukee & St. Paul.—J. C. Stubbs has been appointed Second Vice-President, in charge of the traffic affairs of the road.

Chicago & Northwestern.—W. H. Newman has been appointed Second Vice-President, with office in Chicago, to take effect Nov. 1.

Charles W. Hayward has been appointed Purchasing Agent, in place of R. W. Hamer, resigned.

Chicago, St. Paul & Kansas City.—W. B. Scott, Superintendent of Telegraph, has been appointed Division Superintendent at Des Moines, Ia., in place of G. C. McMichael, appointed General Claim Agent.

Chicago, Santa Fe & California.—C. O. Wheeler has been appointed General Superintendent, with headquarters at Chicago, in place of D. J. Chase, resigned.

Cincinnati, Wabash & Michigan.—E. D. Wheelock having resigned to engage in other business, L. B Cooke has been appointed Auditor, with office in Elkhart, Ind. E. S. Cooke has been appointed Cashier and Paymaster, to succeed L. B. Cooke, promoted.

Colorado Midland.—H. Collbran, Acting General Manager, has been appointed General Manager, with headquarters at Colorado Springs, Col.

Cumberland Valley.—The following officers were elected at a recent meeting of the stockholders of the road: President, T. B. Kennedy, of Chambersburg; Directors, Thomas B. Kennedy, Edward B. Watts and J. Herman-Bosler, Carlisle; J. N. Dubarry, Wistar Morris, H. H Houston, George B. Roberts, Philadelphia; John Stewart, Chambersburg; John P. Green, A. J. Cassatt, Philadelphia; W. W. Jennings, Harrisburg.

Diamond Valley.—Assistant Chief Engineer R. W. Cline, of the Pennsylvania at Harrisburg, has been elected First Vice-President of this road.

Fort Scott Southern.—S. H. H. Clark, George C. Smith, R. Barding, J. F. Richards, Charles Nelson, U. B. Pearsall, D. J. Van Fossen, J. Q. Bryant, I. D. Bronson, C. W. Goodlander and J. R. Collan are the first directors of this company and also of the Fort Scott Eastern. J. H. Richards is President and U. B. Pearsall is Secretary and Treasurer.

Fort Scott Terminal.—The following are the directors of this Kansas company: J. O. Chenault, C. W. Goodlander, I. D. Bronson, O. O. Couch, U. B. Pearsall, John Q. Bryant, Charles Nelson, J. R. Collan, A. W. Walburn, T. W Tollman and J. H. Hill. A. W. Walburn is President and I. D. Bronson is Secretary.

Georgia Construction Co.—At a recent meeting of stockholders the following board of directors was elected: A. B. Graves, New York; R. A. Lancaster, New York; R. K. Dow, of Claremount, N. H.; J. W. English, President of the Chattahoochee Brick Co., Atlanta; A. B. Lowe, Atlanta; G. Gunby Jordan, Columbus; T. E. Blanchard, Columbus. G. Gunby Jordan was elected President. The company was organized to build the Georgia & Tennessee.

Georgia Midland & Gulf.—R. H. Screven having resigned the position of Auditor, W. G. Little has been appointed Acting Auditor at Columbus, Ga.

Hodgenville & Elizabethtown.—The following directors were elected at the recent annual meeting: Gen. John Echols, Maj. Thomas H. Hays, Col. T. W. Bullitt, Jacob Hubbard, J. L. Frazier and Krebs. J. Hubbard was re-elected President.

Jacksonville Southeastern.—W. J. Hemphill, Master Mechanic, has been promoted to be Superintendent of Motive Power and Machinery, with headquarters at Jacksonville, Ill.

Louisville, Evansville & St. Louis.—At the annual meeting held in Belleville, Ill., last week, the old directors were re-elected as follows: D. J. Mackey and W. Heilman, of Evansville; C. C. Baldwin and James Stillman, of New York; Bluford Wilson, of Springfield, Ill.; E. O. Hopkins, of Peoria, Ill.; Thomas W. Scott, of Fairfield, Ill.; G. A. Koerner and A. M. Wangelin, of Belleville, Ill.

Manitoba & Southeastern.—The directors of this road are: James O'Connor, Alex. Logan, W. R. Sinclair, Jas. Flannigan, Roger Marion, E. Trudel and Robert Bullock.

Milwaukee & Northern.—F. A. Butterworth has been appointed Assistant General Freight Agent, with headquarters at Milwaukee, Wis.

Minneapolis & St. Louis.—A. E. Clark has been appointed General Solicitor, with office at Fort Dodge, Ia., to succeed the Hon. J. D. Springer, resigned.

Moosilauk.—The incorporators met in Concord, N. H., Oct. 16, for organization and the following were elected directors: J. H. Pearson, H. N. Turner, C. A. Busiel, W. T. Daniell, Ira Whitcher, A. B. Woodworth, and E. B. Mann. J. H. Pearson was chosen President and S. B. Page, Clerk.

Nashville & Decatur.—The stockholders of the company at a meeting held in Nashville, Tenn., last week, elected the following directors: D. B. Cliffe, Franklin; Joseph E. Washington, Cedar Hill; A. W. Harris, William M. Duncan, John Ramage, John Orr, Samuel Seay, Byrd Douglass, James H. Collins, Joseph H. Thompson. M. A. Spurr and William W. Berry, Nashville; Lucius Frierson, Columbia; Hon. Thomas M. Jones Pulaski and W. Richard Pryor, Athens, Ala. The directors elected D. B. Cliffe, President, and G. W. Seay, Secretary.

New York, Bridgeport & Eastern.—This company has been incorporated in Connecticut by Thomas N. Brown and Charles D. Ingersoll of New York; Henry R. Parrott, of Bridgeport; William Rotch, of Boston; George E. Forbush, of Brookline, Mass., and others interested in the New York & Boston Rapid Transit road and the New York & Connecticut Air Line.

New York Central & Hudson River.—A. W. Eggleston, who has been Roadmaster of the Hudson River Division, has been transferred to White Plains and placed in charge of the Harlem Division.

New York, Susquehanna & Western.—Charles D. McKelvey has been elected General Superintendent, and will assume the duties of the office Nov. 2 next.

Northern Pacific.—At the annual meeting in New York City, Oct. 18, the following directors were elected: William L. Bull, Charles T. Barney, Charles B. Wright, Thomas F. Oakes, Charles L. Colby, Colgate Hoyt, Henry Villard, George Austin Morrison, James B. Haggin, Charles H. Leland, James B. Williams, Charles C. Beaman, Rosewell G. Rolston. Mr. Wright is of Philadelphia, the rest of New York. The new directors are William L. Bull, Geo. Austin Morrison, James F. Haggin, Charles H Leland and Charles C. Beaman. They succeed Frederick Billings, of Vermont; Robert Harris, John U. Brookman and Brayton Ives, of New York, and John C. Bullitt, of Philadelphia.

Nova Scotia Midland.—At a meeting of shareholders held last week at Halifax, N. S., H. Richmond, J. A. Hilton, W. A. Walton, L. C. McKain, Wm. Ross, S. H. Holmes and B. W. Chapman were elected directors. Herbert Richmond was elected President, S. H. Holmes, Vice-President; J. A. Hilton, Treasurer; T. V. Bright, Secretary, and H. W. Lester, General Manager.

Ohio & Mississippi.—The annual meeting of the stock holders and bondholders of the company was held in Cincinnati, Oct. 10. The four retiring directors, A. Gracie King, George C. Magown and Charles R. Flint, of New York, and B. S. Cunningham, of Cincinnati were re-elected. The directors re-elected the following officers: J. F. Barnard, President and General Manager; Robert Reid, Treasurer; E. P. Cutter, Secretary and Auditor.

Arthur G. Wells has been appointed Assistant to the General Manager, with office at Cincinnati.

Ohio River.—Alexander Laird has been appointed Master Mechanic, in place of E. E. Jenks, resigned, with office in Parkersburg, W. Va.

Pittsburgh, Akron & Western.—At a meeting in Cleveland this week William Semple, Jr., and James D. Callery, of Pittsburgh, were elected directors.

Pullman Palace Car Co.—The annual meeting of the company was held in Chicago, Oct. 17, over $17,800,000 of capital stock being represented. The following directors were re-elected: George M. Pullman, John Crerar, Marshal Field, J. W. Doane, Norman Williams, O. S. A. Sprague, of Chicago, and Henry C. Hulbert, of New York.

St. Louis, Kansas City & Colorado.—The stockholders of the company met in Fort Scott, Kan., Oct. 15, and elected the following directors: Allen Manvel, of Chicago; Geo. C. Magoun and John McCook, of New York; Wm. Libby, of Boston; J. T. Emerson and I. H. Sturgeon, of St. Louis; T. C. Jones and John C. Carpenter, of Chanute, and C H. Osborn, of Fort Scott. The directors elected the following officers: Allen Manvel, President; J. W. Reinhart, Vice-president and General Auditor; John W. Gallup, Secretary and Treasurer; John McCook, General Counselor; Geo. L Goodwin, Assistant Secretary; J. P. Whitehead Comptroller; J. T. Emerson, Chief Engineer and Superintendent.

Salisbury & Harvey.—The following are the incorporators of this New Brunswick company, which is a reorganization of the Albert road: R. J. Griffith, W. M. Melford, J. S. Partridge and A. Rogers, of London, Eng., and R. O. Stockton, of St. John, N. B.

Sheboygan & Southwestern.—The directors have elected the following officers: President, Joseph G. End; Vice-president, M. A. Bodenstein; Secretary James Mallman; Treasurer, A. F. Winter.

Sioux City & Northern.—F. C. Hills has been appointed General Manager, with office in Sioux City, Ia.

Southern Pacific.—Richard Gray has been appointed General Traffic Manager, with office in San Francisco. The appointment takes effect Nov. 1.

South St. Paul.—The first board of directors of this Minnesota company are: William Denny, William W. Todd, A. S. Weymouth, Michael Gahan and William S. Follmer.

Union Pacific.—The system is to be divided into three general divisions, each division being in charge of a general manager. All the lines in Nebraska, Kansas and Colorado, including the main line east of Cheyenne, but excepting the St. Joseph & Grand Island road, the Kansas Central, the Leavenworth, Topeka & Southwestern and the Leavenworth branch, will be operated as one division, known as the Mountain Division. All the lines west of Huntington, including the lines and ships of the Oregon Railway & Navigation Co., the lines of the Oregon Railway Extension Co. and the Washington & Idaho road will be operated as the Pacific Division. Edward Dickinson has been appointed General Manager of the Missouri River Division; G. M. Cuming, General Manager of the Mountain Division; C. J. Smith, General Manager of the Pacific Division. The office of General Manager of the Union Pacific has been abolished. At a meeting of the directors of the company held in Boston, Oct. 18, T. L Kimball was elected Third Vice-President. C. S. Mellen has been appointed General Traffic Manager. C. H. McKibbon has been appointed General Purchasing Agent, vice C. S. Mellen, resigned. J. S. Cameron has been appointed Chief of the Construction Department. The changes go into effect Nov. 1.

Winnipeg & Southeastern.—The following are the directors of this company: Jas. H. Ashdown, A. McIntyre, Kenneth Mackenzie, R. J. Whitla, J. B. Mather, D. E. Sprague, Gilbert McMicken, W. W. Watson, C. P. Brown, J. E. Hannah, E. Richard and E. Egan.

OLD AND NEW ROADS.

Albert.—This company has passed into the control of the bondholders, who have organized the Salisbury & Harvey, under which name they will operate it.

Albert Colonization.—This company proposes to construct a road from Cassils, on the Canadian Pacific, westerly to the Bow River, at or near Grassey Island, thence across the Bow River to the mouth of the Crow's Nest Pass, and through the Pass to the Pacific Ocean.

Arden & Duck Mountain.—This company proposes to build a road from Arden on the Manitoba & Northwestern northerly along the east of Riding Mountain and Duck Mountain to the Saskatchewan River. Also a branch crossing the Narrows of Lake Manitoba.

Atlantic & Danville.—The city of Danville, Va., last week, voted $150,000 towards the western extension of the road, from Danville to the coal fields of Southwest Virginia. The city had already voted a like amount to the eastern end of the line, from Danville to Norfolk, and that end of the road, 200 miles long, will soon be open for business. The work on the western extension will begin soon, and Bristol, Tenn., the probable western terminus of the line, will probably also subscribe $150,000 to the road.

Augusta & West Florida.—The company has asked the city of Thomasville, Ga., to subscribe $50,000 to secure the building of the road to that point. The company proposes to build the road from Augusta to Thomasville, about 230 miles. The work is very light, and but three iron bridges will be necessary. The route is through more than 100 miles of virgin timber, nine-tenths of which is the long-leaf yellow pine. The land is productive and easy to cultivate, and is adapted to the growth of corn, cotton and early vegetables. C. E. Smith, 3 Warren Block, Augusta, is President.

Ava, Grand Tower & Cairo.—This company has filed articles of incorporation in Illinois. It proposes to construct a road from Ava to the city of Cairo, passing through Grand Tower, in Jacob County, and Thebes, in Alexander County, and through the county of Union. The principal office is located at Ava, and the capital stock is $1,000,000.

Beech Creek.—It is stated that the company will soon commence a survey for an extension from the present terminus at Jersey Shore, 16 miles west of Williamsport, Pa., to the latter city, which it at present enters over the Pine Creek road. It is proposed to use the Fall Brook tracks to Newberry Junction, and from thence enter the city by the Philadelphia & Reading.

Camden, Chester & Gaffney City.—The survey for this road was begun last week at Chester, S. C., and will be continued from that point to Gaffney City. Florence, S. C., is the proposed southeastern terminus of the line. C. L. Kingsley, of Raleigh, N. C., Chief Engineer, is in charge of the survey. J. V. Sarratt, of Gaffney City, is President.

Camden County.—Proposals for building this New Jersey road will be asked within ten days. It is to be an extension of the Atlantic City road of the Philadelphia & Reading and will extend from Mt. Ephraim to Spring Mills, N. J., about eight miles. The maximum grades will be 60 ft. per mile, and curves will be 8 degrees. The road, when built, will be operated by the Atlantic City road. The capital stock is $80,000, and a like amount of bonds will be issued. A. Garwood, of Camden, is President.

Canadian Pacific.—The western extension of the Ontario & Quebec has been completed between London and Chatham, Ont. The bridge over the Thames River, at Chatham, is finished, and the short bridge over the creek on the other side is nearly so. When this work is completed the line will be finished as far west as the Detroit River. The road will not be formally opened until the track is laid to Windsor, which will probably be before Nov. 15.

Central of Georgia.—The annual report shows that the gross earnings of the last fiscal year were $5,107,595; operating expenses, taxes and betterments, $3,316,266; net earnings, $1,799,328. Net income from Ocean Steamship Co., $476,454; from bank, $37,244; from investments, $132,368; total net, $2,437,395; interest on bonds, $864,895; on loans, $50,582; on certificates of indebtedness, $276,000; rentals of roads, $462,162; excess of income over fixed charges, $783,665; surplus from last year, $478,226; total, $1,262,891. Disposed of in payment of $600,000 in dividends; 23,376 advanced on Georgia Railroad lease; $15,000 set aside for Montgomery & Eufaula sinking fund, and $100,000 for the Ocean Steamship Co. sinking fund, leaving a surplus for dividends of $523,515.

Central of Guatemala.—A Panama dispatch says that the Central Railroad of Guatemala is in course of sale to a French syndicate, the contract of sale having been signed, with an option granted to the purchasers for its final ratification. Mr. Huntington has effected this transaction with M. Henri de Cottu, who is well known as a director of the Panama and Suez canals. M. de Cottu has also effected with the government a contract for the construction of the Northern Railroad of Guatemala, which will form a through interoceanic route.

Chesapeake & Ohio.—The board of directors in its annual report says it is the intention of the management to take out the few remaining wooden bridges on the line and replace them with iron of the heaviest build; to fill up some of the remaining trestles, to put additional ballast on the road, and to continue the extension of sidings so as to accommodate the long freight trains that are being run.

Chicago Central.—This company has filed articles of incorporation in Illinois. Two lines are to be constructed, one from Chicago to the western boundary of the state, in Adams County, near Quincy, and the other from Chicago to the eastern boundary of the state, at a point near the south boundary of Iroquois County. The capital stock is $1,000,000, and the principal office is to be at Chicago.

Chicago, Rock Island & Pacific.—The southwestern branch of the Chicago, Kansas & Nebraska Division was completed from Pond Creek to King Fisher, I. T., last week and has been opened for business. The following are the distances from Pond Creek: To Wild Horse, 11 miles; to Enid, 19 miles; to Waukom's, 30 miles; to Hennessey, 42 miles; to Dover, 51 miles, and to King Fisher, 59 miles. Regular agencies will be established at Enid, Hennessey and King Fisher.

Columbia, Newberry & Laurens.—Tracklaying is to begin immediately on the 21 miles between Columbia, S. C., and Little Mountain, already graded. Between Little Mountain and Newberry 22 miles grading is still in progress.

Concord & Montreal.—The Lake Shore road, which is to be operated by this company, was finally completed Oct. 19, the last rail being laid on that day at Alton Bay, where connection is made with the Boston & Maine. The line will be opened for traffic Nov. 1. It extends from Lake Village, on the Concord & Montreal, southeast along Lake Winnipiseogee to Alton Bay, 17 miles.

Cumberland Valley.—Surveys have, it is reported, been begun for an extension of the road from Fort Loudon, on the South Pennsylvania road, over the mountains westward to the Broad Top coal fields.

Danville, Mebane, Pittsboro & Southern.—This is a proposed road intended to run from Danville through Caswell, Alamance, Orange and Chatham Counties, in North Carolina, to a connection with the Raleigh & Augusta Air Line. A meeting will be held in Yancevville, N. C., Nov. 12, to organize the company and elect officers.

Danville & Smithville Junction.—This company has applied to the Ontario Legislature for a charter to build a line from Danville, Haldimand County, to a point on the proposed Toronto, Hamilton & Buffalo, near Smithville, Lincoln County, Ont.

Dexter & Piscataquis.—About 15 miles of track has been laid on this road, which is being built from Dexter to Dover, Me., 17 miles. A three-span iron bridge is now being built over the Piscataquis River, and 200 men are working north of this, completing the last two miles of the road. It will probably be opened for regular passenger traffic Dec. 1, being operated by the Maine Central, to which it is leased for 999 years. The grades average about 80 ft., and the maximum curves are five degrees. The rails weigh 67 lbs. per yard. Brown Bros. & Co., of Dover, are the contractors. The road has been built by a local company for the purpose of getting communication and connection by the Maine Central without going to Bangor by the Bangor & Piscataquis road, saving 53 miles from and to Boston and Portland. A capital stock of $110,000 was subscribed along the route, and an issue of $175,000 in bonds was sold at 97½, which will give ample funds to complete the road.

East Louisiana.—P. L. Gusman has commenced a survey for a proposed extension of this road from Covington or Abita Springs, La., north a distance of about 30 miles, to Franlinton, Washington County.

Fort Madison, Western & Northwestern.—This company has been organized by the creditors of the Fort Madison & Northwestern to purchase the road when sold, and to extend it, probably to Ottumwa, Ia. The Fort Madison & Northwestern now extends from Fort Madison to Collet, 45 miles.

Fremont, Elkhorn & Missouri Valley.—A large force is at work on the extension of the Niobrara branch, from Verdigris north 20 miles to Niobrara, Neb., at the junction of the Missouri and Niobrara rivers. It is expected to have the extension completed and in operation by Dec. 1. This branch was recently opened from Creighton to Verdigris, Neb.

Grand Tower & Cape Girardeau.—Tracklaying on this road, which is being built from Grand Tower, Ill., to East Cape Girardeau, 25 miles, was completed to the latter point last week. Ballasting will begin immediately, and it is expected to open the road in about a week. The incline for

the Mississippi River has been finished, but the one on the eastern side will not be finished until next week. The transfer boat is ready.

Green Bay, Winona & St. Paul.—The plan for extending the road to Omaha is a success, more than the required number of stockholders having signed the plan. The assessments of the securities have been called, payable Nov. 1 at the Farmers' Loan and Trust Co.

Henderson State Line.—Elections will be held at Morgantown, Ky.; Woodbury, Ky., and Sugar Grove, Ky., relative to voting $25,000 to this road.

Indianapolis & Vincennes.—All the grading is finished on the branch now being built from Gosport, Ind., south 4½ miles, through the Big Creek Valley to North Bedford, to the quarries of the Big Creek Stone Co. and the North Bedford Stone Co. Tracklaying is in progress and over a mile of track is laid, and the line will probably be opened by Jan. 1. The bridge builders are now at work on the bridge across the White River. The grades of the branch are about 60 ft., and the curves 6 deg. The stone to be reached by the branch is Indiana marble, and the finest grade of oolitic stone, similar to the stone used in the Vanderbilt mausoleum, and now being used in the soldiers' monument, 265 ft. high, in Indianapolis. In these quarries a face of 80 ft. can be cut. Blocks of stone 100 ft long and 80 ft. square are cut out with chanelling machines, and subsequently cut into the sizes required. Oolitic stone was used in the piers of the Illinois Central Cairo bridge, over the Ohio River, and is now being used in the bridge in course of construction at Memphis.

Interoceanic.—This road will be opened for passenger traffic this month from the City of Mexico to Pueblo and Perote. Tracklaying has been completed for quite a while, but it has taken some time to completely ballast the road.

Irondale, Bancroft & Ottawa.—This company, which has a subsidy from the Dominion Parliament of $145,000 for the construction of a line from a point on the Victoria branch of the Midland to Bancroft, Ont., is now applying to the Ontario government for a further subsidy of $3,000 per mile upon 50 miles of road to reach the iron-ore mines at Irondale, where it is proposed to erect a furnace with an annual capacity for making 100,000 tons of pig iron. C. J. Pusey, of Irondale, is General Manager.

Ithaca, Auburn & Western.—George M. Diven, of Elmira, has purchased this road from the Lehigh Valley, and intends to discontinue all passenger, mail and express trains. It is stated that the road will be abandoned temporarily, perhaps permanently. The road was sold at foreclosure sale last August. In April, 1883, it was leased to the Southern Central, and has been operated by the Lehigh Valley as lessee of the Southern Central.

Kansas City, Rich Hill & Nevada.—Col. Edward Brown, President of the road, is quoted as saying that he has finally arranged financial matters in the East, and secured enough funds to complete the road. Construction will soon be resumed. The line is now graded and ready for the bridges and ties for nine miles west of Eldorado, Mo. The road will pass through Walker, ten miles northeast of Nevada, passing through coal fields to Rich Hill. Trains will probably be run from Walker to Eldorado by Jan 1.

Kennebec Central.—At a meeting of directors held last week it was voted to increase the capital stock to $40,000. The bids recently asked for building the road from Randolph to Togus, Me., five miles, were opened and the contract will be awarded this week.

Kentucky Midland.—The section of this road from Georgetown, east through Newton, to Paris, Ky., a distance of 17 miles, is now all graded ready for tracklaying, which will commence immediately. The road is now in operation from Frankfort east to Georgetown, 23 miles.

Lehigh Coal & Navigation Co.—The Board of Managers have decided to increase the capital stock by issuing at par to present stockholders an allotment of 10 per cent. of new stock, which will increase the total capital to $13,943,250. This is the first time that such an issue has been made by this company within the past 23 years. The proceeds from the new issue of stock, it is stated, are to cover numerous betterments and constructions and other property already possessed and to be acquired.

Louisville, Hardinsburg & Western.—The company has been unable to obtain the right of way into Hardinsburg, Ky., and the force which has been working between Cloverport and Hardinsburg has been transferred to the line south of the latter place, where the work will be continued until the disputed right of way has been settled.

Louisville, New Orleans & Texas.—Regular trains on the Boliver extension between Rosedale and Coahoma, Miss., began running last week, and trains will begin running over the entire loop from Rolling Fork to Coahoma this week.

Louisville Southern.—The Versailles & Midway road has been formerly transferred by Robert Wallace, Superintendent, to the lessees of the Louisville Southern, and the latter have assumed full control of it. The road extends from Versailles to Georgetown, Ky., 10 miles.

Manhattan (Elevated).—A hearing which involves 426 parcels of city property, has been begun in the Supreme Court Chambers in New York. The action is instituted by the Metropolitan Elevated (leased to the Manhattan) to have commissioners appointed to appraise damages to abutting property owners. The attorneys for the property owners argue that this would not facilitate the pending litigation, because the commissioners could only assess future damages, while past damages would still have to be assessed by the courts. For this reason two trials would be necessary in every case, instead of one as now. It is also urged that in the past, when commissioners had awarded small damages, the company had accepted them, whereas, when substantial damages were assessed the company discontinued the proceedings after having put the property holders to the expense of a useless trial.

Manitoba & Southeastern.—Sinclair & Flannigan, who have a contract for grading part of this road, commenced work last week near Winnipeg with 30 teams. The route has been staked as far as St. Anne, Man., about 40 miles southeast of Winnipeg. The Winnepeg & Southeastern has a charter to build over practically the same route as that over which this company proposes to build, and it had surveyed its line and proposed to begin work when this company secured a charter and had a portion of the right of way granted to it which was required by the Winnipeg & Southeastern. This action has prevented the latter company beginning work.

Mexican National Construction Co.—About 80 miles of the Guadalajara branch is now in operation and construction is making rapid progress on the rest of the line. It is expected to have the entire line from Manzanillo through Colima and then north to Guadalajara completed early next spring.

Milwaukee, Menominee Falls & Western.—About three miles of grading have been completed on this road, which is now under construction from Granville to Sussex, Wis., 10 miles. The Hadfield Co., of Waukesha, Wis., are the contractors. Extensive limestone quarries will be opened by the road. William Powrie, of Sussex, Wis., is chief engineer.

Missouri, Kansas & Texas.—A plan for the reorganization of the company is proposed by the Executive Committee. It provides that the holders of the consolidated 7 per cent. bonds shall take new 5 per cent. bonds without change in the mortgage. The back interest on this issue is to be paid; one coupon (3½ per cent.) in cash, one coupon in 4 per cent bonds, and the interest for the other year and four months in 5 per cent. preferred stock, at the rate of $1.50 for each $1. It provides that the general mortgage bonds shall be exchanged for new 4 per cent. bonds; the sixes dollar for dollar and the fives at 90 cents on the dollar. The back interest on both issues is to be paid in preferred stock. The present stock is to pay an assessment of $7.50 a share, for which it will receive preferred stock. The capitalization of the company under this scheme will be: Preferred stock, $10,000,000; common stock, $47,000,000; 5 per cent. bonds, $18,000,000, and 4 per cent. bonds, $28,000,000. The earnings of the road on this basis are believed to be ample to meet the fixed charges. The committee charged with the conduct of the reorganization consists of Frederick P. Olcott, Richard King, Henry W. Poor, Henry Budge and Colgate Hoyt. The Central Trust Co. will receive deposits of securities under the agreement.

Missouri Pacific.—Three companies, the Fort Scott Terminal, the Fort Scott & Southern and the Fort Scott & Western, were chartered last week in Kansas in the interest of this company. The roads are to be built to connect the lines of the Missouri Pacific in southern Kansas with each other and the main line. One line is to be built southwest from Fort Scott to connect with the Wichita, Fort Scott & Western, and another is to be built west to connect with the Kansas, Nebraska & Dakota.

Mobile & Ohio.—Judge Allen, in the United States District Court, at Springfield, Ill., this week decided against the constitutionality of the Illinois Water Craft act of 1877, which contains a clause substantially depriving railroad companies of the power to condemn land for right of way to any ferry privilege upon any navigable river bordering on the state. This decision will permit the Mobile & Ohio to obtain a ferry privilege at Cairo, and was rendered in a suit brought by that company. In the litigation, which has been pending for two years, the Mobile & Ohio, as lessees of the St. Louis & Cairo, attempted to obtain a right of way down to the Ohio River, at Cairo, for the transfer of passengers and freight by boats to their lines on the Kentucky side.

Mobile, Jackson & Kansas City.—The right of way for this road is now being secured by two parties between Mobile and Hattiesburg, and between Hattiesburg and Jackson, Miss. The locating surveys were completed some months ago.

Monongahela River.—This road has now been completed and trains run from Fairmount south along the Monongahela River to Clarksburg, W. Va., 25 miles. The road connects at both points with the Baltimore & Ohio, and at Clarksburg with the Clarksburg, Weston & Midland, over which it will reach Weston. The extension of this latter line, the Weston & Elk River, south to Braxton, is being rapidly built, and will be opened early next month.

Montgomery, Tuscaloosa & Memphis.—The locating survey of this road, which is an extension of the Alabama Midland from Montgomery northwest to Tuscaloosa, Ala., 102 miles, was completed to within three miles of Tuscaloosa, last week, when the engineers suspended work and returned to Montgomery, as the company had not yet decided where to enter Tuscaloosa. The locating survey varies little from the preliminary survey. A meeting of the stockholders will be held in Montgomery, Dec. 4, to vote on a proposed increase of the capital stock.

New Orleans, Fort Scott & Grand Isl.—Grading on this road is now completed on the first 20 miles from Algiers to Fort Jackson, La., 65 miles.

New Roads.—W. C. Audrews, William McCreery and others have organized a company to build a road from Imperial, Allegheny County, to Frankfort Springs, Pa., a distance of 24 miles. Considerable stock has been subscribed by residents along the route.

New York, Bridgeport & Eastern.—This company has been incorporated in Connecticut with a capital stock placed at $6,000,000, to succeed to the right of way, surveys, etc., of the New York & Connecticut Air Line, whose charter expires this month, the State Legislature having refused to extend it. Maps and specifications of the route have been filed. The survey follows the shore towns from Greenwich to New Haven, 46 miles, and the estimated cost is $5,000,000. The new company organizes under the general railroad law and will ask the next Legislature for special privileges.

Northern Pacific.—At the special meeting of preferred stockholders, held in New York, to consider the proposed consolidated mortgage for $160,000,000, there were 316,000 shares, or more than the necessary three fourths of stock voted in favor of the plan. The whole number registered was 371,626. The shareholders of the company passed a resolution asking the new board of directors to consider the expediency of the distribution of the whole amount due the preferred shareholders under the plan of reorganization as soon as the company shall be financially in position to do so. The plan distributes $101,000,000 for the retirement of existing loans, and for paying premiums on exchanges of bonds $10,000,000 more; for additional branches, terminals, improvements, renewals, etc., $40,000,000, and it leaves $9,000,000 for general purposes.

Northern Pacific & Manitoba.—Seventy miles of the track of the Morris and Brandon branch of this line have been laid, and it is expected that the whole road will be in operation by Jan. 1.

Nova Scotia Central.—The first through train on this road was run Oct. 15, from Middleton, on the Windsor & Annapolis, south across Nova Scotia to Lunenburg, on the Atlantic coast. Robert H. Fraser, of Bridgewater, N. S., is Superintendent.

Nova Scotia Midland.—It is stated that tenders have been accepted for the construction of this road and that work will be immediately commenced.

Ohio & Big Sandy.—The survey for a proposed extension of this road, which has been in progress some time, has, it is stated, been completed, and the line located. The route is from Richardson, Ky., up the Big Sandy Valley, crossing the Cumberland Mountains at the Breaks of Sandy, thence to Pocahontas, Va., on the Norfolk & Western.

Oregon Pacific.—The grading on this road is now finished, including the contract of J. S. Antonelle, to a point 24 miles beyond Gatesville, which is 39 miles east of Albany, Ore. Tracklaying has been completed to a point five miles east of Gatesville, Ore., and 44 miles from Albany. It is claimed that the grading and tracklaying will be finished this winter to a point 53 miles beyond Gatesville. This will take the road to the end of the eight miles already graded on the summit of the Cascades near Flogg Pass, and leaves 29 miles still to be graded.

Orting & Southeastern.—This line is being built by the Northern Pacific southeast from Orting, Wash., through the upper Puyallup valley. The company is about to let a contract to extend the line to Lake Kaponsin.

Pennsylvania.—The statement of the business of all lines of the Pennsylvania east of Pittsburgh and Erie for September, 1889, as compared with the same month in 1888, shows: An increase in gross earnings of $143,306; in expenses of $118,920, in net earnings of $24,386. The nine months of 1889, as compared with same period of 1888, show an increase in gross earnings of $1,311,626; in expenses of $829,235; in net earnings of $482,391. All lines west of Pittsburgh and Erie, for the nine months of 1889, show a surplus over all liabilities of $421,047, being a gain, as compared with the same period of 1888, of $500,793.

The bids for building the branch from the connection with the line in Philadelphia to League Island and in the Delaware River have been received, and they will be opened in a few days and the contract awarded.

Rochester & St. Paul.—At an election held in Rochester, Minn., Oct. 18, on the proposition to issue $45,000 in bonds to aid this company in building a line from Rochester to Eden, on the Chicago, St. Paul & Kansas City, 20 miles, a large majority of votes was recorded in favor of issuing the bonds.

Rockaway Valley.—Articles of association were filed and the necessary deposit of $2,000 per mile was made with the Secretary of State, of New Jersey, last week for the Peanack extension of the road in the counties of Somerset and Morris. Work will begin at once.

St. Louis, Cable & Western.—The road passed into the hands of a Receiver Oct. 17, the General Manager of the road being appointed Receiver. The floating debt of the company is $250,000, the bonded debt $600,000 firsts and $400,000 seconds, held by Lee Higginson & Co., of Boston, and the road is valued at $1,000,000. The applicants are Joseph G. George, of Massachusetts; the Walker Manufacturing Co., of Ohio, and John A. Roebling's Sons & Co., of New Jersey. These creditors were granted judgment by default against the road in the Circuit Court at St. Louis.

St. Louis & California.—A St. Louis dispatch states that an elaborate bill has been prepared by First Vice-President O'Day of this road, which will be introduced in the next Congress in behalf of this company, to secure the right to build about 1,500 miles of road in the Indian Territory. The lines will run in various directions, the main route crossing the Pan-Handle of Texas, and connecting with the Atlantic & Pacific, at Albuquerque, N. M. A corporation to be known as the St. Louis & California is to be formed for this purpose.

St. Louis, Des Moines & Northern.—The United States Circuit Court, as Des Moines, Ia., has signed a decree of foreclosure against the road. In February, 1882, the company, in order to secure bonds of $8,000 per mile on the road, executed a trust mortgage to the Mercantile Trust Co., of New York, on all the road, except the line from Waukee to Clive and the undivided one-half from Des Moines to Clive. On Oct. 2, 1889, a supplemental mortgage was given covering the undivided half, and also the stock in the Des Moines Union road. In 1882 the defendant issued bonds to the amount of $303,000, and they remain, with the interest, wholly unpaid. There is due on the coupons $183,770, and unless the company pays the full sum of $486,770 before Oct. 25, with interest and costs, the road will be sold.

Salisbury & Harvey.—This company has been chartered in New Brunswick to succeed to the franchises and powers of the Albert Railroad. The reorganized company has a capital stock of $154,000. The road will hereafter be operated as the Salisbury & Harvey, with Charles R. Scoles as Manager.

Santa Fe & Southern.—The survey for the extension of this road from its present southern terminus at Santa Fe to San Pedro, N. M., which has been in progress for over six weeks, was completed last week, the distance being 46 miles. A feasible route was found, and but little grading will be required for the first 20 miles from Santa Fe. The survey runs through Cerrillos and Golden, crossing the Atchison, Topeka & Santa Fe at the former place.

Seattle, Lake Shore & Eastern.—This company has secured the right of way for the branch line to Davenport, Wash., a distance from the main line of about six miles. A large force of men are at work grading the roadbed, which work they expect to have completed by Nov. 1. Siver & Co. are the contractors on this branch.

Shreveport & Houston—Argument was heard last week on a bill in equity which was filed in the United States Circuit Court in Shreveport, La., by Neil & McDonald, of New York, against this company, asking for the appointment of a receiver, and the sale of the road to pay $78,000 worth of certificates held by the complainants. S. B. McCutcheon, of Shreveport, Vice-President of the road, was appointed Receiver.

Sonora, Sinaloa & Chihuahua.—Tracklaying is to commence on this road in a few weeks at Deming, N. M. The grading is completed from Deming south for about 30 miles, and from Guaymas, Mex., east for about the same distance. From Chihuahua grading is completed west for six miles. The road is to run from Deming via Lake Palomas, Asuncion, Corralitos, Casas Grandes, El Valle and Santa Ana to Guerro, and thence east to Chihuahua and west to Guaymas and Topolobampo Bay, Mex. The total length of the road will be 1,500 miles; all in the states of Sonora, Sinaloa and Chihuahua, Mex. The work will be light most of the distance. Elliot, Huss & Co., of Chicago, have the contract for building the first 150 miles from Deming south, and have opened an office at Deming. Richards, Clegg & Co., of Ottawa, Ohio, have the contract for 150 miles in Mexico. These are all the contracts yet let. The Mexican government grants a subsidy of $13,000 per mile, and many other valuable concessions of land, right of way, etc., have been secured.

South St. Paul.—This company has been incorporated in Minnesota with a capital stock of $50,000 to construct a road from South St. Paul in a westerly direction to a point in the Village of Mendota, and easterly on the line of the Chicago, Burlington & Northern to a point on the line of the Chicago, Milwaukee & St. Paul, on the east bank of the Mississippi River.

Spokane Falls & Northern.—This company has let a contract to Burns & Chapman, of Spokane Falls, Wash., for grading fourteen miles of the road bed from Colville to Marcus. The contractors are now subletting the contract and active operations will begin at once.

Tennessee Midland.—At the annual meeting, to be held at Memphis, Tenn., Dec. 4, the stockholders will be asked to approve and confirm the issue of income bonds and the execution of the mortgage securing the same heretofore authorized.

Toronto, Hamilton & Buffalo.—A report is current that this company and the Brantford, Waterloo & Lake Erie roads have been merged. The latter line is in operation from Brantford to Waterford, Ont., on the Michigan Central, and has surveyed an extension to Hamilton and Toronto. This company has a charter between Toronto and Hamilton, and also from Hamilton to Niagara Falls.

Trenton & Atlantic.—This is the name of the company which proposes to build the road from Trenton, N. J., across the state to Point Pleasant on the Atlantic coast, about 42 miles, which was referred to in our issue of Sept. 20 under New Roads. The work will be easy, the grades being only one per cent., and the maximum curve is five degrees. There will be several bridges, one having a pivot span of 150 ft., others with deck spans of 100 ft. and 50 ft. and one with a through span 150 ft. long. C. C. Vermeule, 71 Broadway, New York, is Chief Engineer.

Wabash.—By consent of all the creditors and others interested in the foreclosure litigation, Judge Gresham this week entered an order winding up the receivership of Gen. John McNulta. The receiver has audited and paid practically all claims against the receivership, except claims due to connecting roads for balances, and the court ordered the new company to settle these claims as they came up, instead of keeping the receiver's office open for an indefinite time. The new company takes from the receiver all the money, accounts, cases in action in the hands of the receiver, and agrees to settle with the connecting roads for freights, and this abolishes the office of receiver. Suits for personal injury will be defended, the judgments to be entered against the receiver. The court reserves the power to retake the Wabash property if the new company fails promptly to pay any of the creditors as above. The receiver and his sureties are discharged from all liability on his bond, and the receiver is discharged as to any further duty. He is retained, however, to allow any parties having suits now pending or entitled to begin suits along the line to bring suit legally against him as receiver, without which suits would have to be begun anew.

Wadley & Mt. Vernon.—Grading has been in progress for some time on this Georgia road, which is being built from Wadley South toward Mt. Vernon, and tracklaying has also been commenced at Wadley.

Western Counties.—Surveying parties have commenced the location of an extension to Carleton, N. S. The company proposes shortly to extend its road from Yarmouth to Shelburne.

Western New York & Pennsylvania.—Surveyors are locating a line for a proposed extension of the road from Stoneboro ugh to Oil City, Pa. Heretofore the Lake Shore & Michigan Southern tracks have been used between the two points, but it is stated the company has been notified that after Jan. 1 the arrangement will cease. The proposed line will follow the Big Sandy Creek to the Allegheny River, eight miles below Franklin, and then up to the latter place. The New York, Lake Erie & Western tracks will be used from Franklin to Oil City.

Williamsport & Binghamton.—Several of the contractors on this road, which was being built from Williamsport to Binghamton, N. Y., 110 miles, have recently given up their contracts and little or no work is now being done. The officers of the company claim that the work will soon be resumed, but this does not appear likely from present indications.

Wilmington, Onslow & East Carolina.—Grading is being finished rapidly, about 20 miles being now completed from Wilmington, N. C., to a point in Pendar County, near Chapel Pond.

Winona & Southwestern.—Nearly 300 men and 175 teams are at work on the 10 miles from Bear Creek, Minn., which was recently put under contract, and nearly five miles of the grading has been finished.

TRAFFIC.

Traffic Notes.

Press dispatches report the arrival in England of cattle from New York suffering from pleuro-pneumonia.

The Nebraska State Board of Transportation has issued an order requiring the railroads to put in force the coal tariff, recently prescribed by the board, within 30 days.

The Chicago & Northwestern has made an arrangement with the Union Pacific whereby through trains will be run over the two roads between Chicago and the Western termini of the Union Pacific, to take effect very soon.

Freight from Montreal to St. John, N. B., is now being run through over the Intercolonial in three days, whereas it is said that before the construction of the competing line of the Canadian Pacific through Maine shipments were from 7 to 10 days in transit between those points.

The total of shippers' weights was 35,601,594; actual weight, 42,981,302; increase, 7,379,708, being 20 per cent. According to the method of approximating the gain, as adopted by the Central Traffic Association, the railroads saved $3,938. The expenses of the bureau were $507, making a net saving of $3,431.

The Missouri Pacific has notified Chairman Midgeley, of the Southwestern Freight Association, that, beginning Nov. 1, it will quote established rates between Chicago and Kansas City in connection with the Illinois Central and the Vandalia. This opens a new line between Chicago and Kansas City, making eight in all.

The Cleveland Weighing and Inspection Bureau's report shows that the actual weight of freight shipped from Cleveland during the month of September exceeded the weight reported by the shippers by 7,379,708 lbs. This is the largest gain yet reported by the bureau, being 350,000 lbs. more than was saved in August. The weighmaster weighed and inspected 1,109 cars.

The Chicago & Alton has established a regular weekly service of through second-class sleeping cars between St. Louis and the Pacific Coast. The cars are new, and have large toilet rooms for ladies and for men. The sections are provided with sliding headboards, which completely separate one section from another, giving to the passengers all the privacy which may be had in a regular sleeping car.

Chairman Walker, of the Inter-state Commerce Railway Association, has rendered a decision practically denying the application of the Chicago, Milwaukee & St. Paul to make coal rates to Dakota and Minnesota points from Milwaukee which shall compete with those made by lines from Duluth. The Chicago, Milwaukee & St. Paul has, however, given ten days' notice of a reduction to meet lake rates, notwithstanding the decision against a reduction.

The Wabash has notified Chairman Faithorn that it has been advised by the St. Louis, Keokuk & Northwestern that it cannot continue to form a line with the Wabash between St. Louis and St. Paul via St. Peter and the St. Louis, Keokuk & Northwestern, Burlington, Cedar Rapids & Northern, and Minneapolis & St. Louis. The Wabash will therefore publish a tariff in connection with the Iowa Central and the Chicago, St. Paul & Kansas City, ignoring the long and short-haul clause. The Wabash claims that its course will not disturb the Iowa situation, as it does not propose to allow the commodity rates to St. Paul to affect the rates intermediate on the direct line. The reason for this action is that the Western Freight Association would not agree to the application of the regular basis of 105 per cent. of the Chicago rates on traffic from St. Louis to St. Paul if the low 40-cent tariff was used, because the use of a basis of less than 60 cents would seriously disturb the rates to points in Iowa. The Wabash, therefore, will apply the 40-cent basis on all through traffic via the Iowa Central and Chicago, St. Paul & Kansas City roads only, but will charge the 60-cent basis on all traffic to intermediate stations.

Transportation of Liquor in Iowa.

The Supreme Court of Iowa has rendered a decision bearing upon the enforcement of the prohibitory liquor law. It was alleged that certain liquors were kept in the Chicago, Rock Island & Pacific freight depot in Des Moines, intended for sale in violation of the law. The railroad company was made a party, the case was tried in the district court and the liquors were ordered destroyed. The defendants appealed, claiming that the liquors were in the custody of the company as a common carrier, and that the matter became one of interstate commerce, over which the state courts had no jurisdiction. The decision of the Supreme Court finds that the consignee was a persistent violator of the law, and had been receiving liquor in this way for some time, using the freight office as a storage room to keep the packages till needed. These liquors had been received from 6 to 15 days prior to the seizure. The court holds that the interstate commerce feature of the transaction ended when the liquors had reached the freight house; that the railroad in keeping them for several days was holding them not as a carrier, but as a warehouseman. Under the circumstances it rules that the liquor was being held for illegal purposes, and was no longer a matter of interstate commerce, and was properly seized and condemned.

Private Stock Cars.

Judge Wallace, of the United States Circuit Court for the Northern District of New York, has rendered a decision in the petition of Morris and the American Live Stock Transportation Co. for a mandamus against the Delaware, Lackawanna & Western. The decision was formally filed on Saturday, and refuses the injunction against the road which was asked for. Nelson Morris, the well-known cattle shipper, desired to ship his stock over the Delaware, Lackawanna & Western in cars of the American Live Stock Transportation Co. The road refused to transport the stock under these conditions, and Morris and the American Live Stock Transportation Co. jointly brought suit for a mandamus, claiming unjust discrimination against them, because the railroad was wont to receive cattle from other shippers in cars belonging to the Lackawanna Live Stock Express Co.

The road denied generally any unjust discrimination, and set forth that it had entered into a contract with the Lackawanna Live Stock Express Co. for a term of five years for the use of its cars; that such cars were not used exclusively by any one shipper, but were available to all shippers; that these cars, unlike those of the American Live Stock Co., could be used for coal as well as cattle, and that, in consideration of the special contract, the defendant agreed to use the cars upon its road and pay mileage therefor as if such cars were furnished by a connecting company. Furthermore, in consequence of this arrangement this road and several others had agreed to discontinue hauling private stock cars, except for horses. Judge Wallace says in his decision:

"It is unnecessary to decide in the present case whether the respondent would be guilty of unjust discrimination if it should refuse to enter into such an arrangement as it has made with the Lackawanna Live Stock Express Co. The respondent does not prevent either relator from transporting cattle over its road in the cars furnished to it by the Lackawanna Live Stock Express Co., and if the facts set forth in the return are true the cars belonging to the Lackawanna Live Stock Express Co. differ so in construction from those of the American Live Stock Transportation Co., as well as from those of ordinary private stock cars, that the respondent can use them more profitably and conveniently than the others, because they can be used for its ordinary coal traffic when not in use for carrying cattle.

"So, also, if the facts in the return are true, the contract made with the Lackawanna Express Co. secures to the respondent the advantage of having a definite number of cars always at its disposal for use in its general business, an advantage which it could not have by using the cars of the American Live Stock Co., or the cars of any other shipper, in the absence of such a contract. Thus, there are reciprocal rights and obligations arising from the contract between the respondent and the Lackawanna Live Stock Express Co., and special circumstances in their relations affecting the question of compensation, which are not present in the conditions of the service which the relators demand. In short, there is no unjust discrimination toward the relators as to rates, because the respondent does not refuse to carry traffic for them under substantially similar circumstances and conditions to those of its services for the Lackawanna Live Stock Express Co.; and for the same reason it does not give the latter any unreasonable preference or advantage over the relator, but only such a preference or advantage as it may fairly give, because of the difference in cost, expense and the exceptional character of the service."

Anthracite Coal Production.

The following is the statement of anthracite coal production for the month of September, 1889, compared with the same period last year, as compiled from returns furnished by the mine operators:

	Sept., 1889.	Sept., 1888.	Dec.
From Wyoming region	1,769,570	2,116,797	347,226
From Lehigh region	512,293	628,248	115,954
From Schuylkill region	905,018	1,171,279	266,261
Total	3,186,882	3,916,325	729,442
	Year, 1889.	Year, 1888.	In. or Dec.
From Wyoming region	13,703,875	16,141,451	D. 2,437,575
From Lehigh region	4,569,542	3,844,577	I. 724,964
From Schuylkill region	7,313,872	7,549,587	D. 235,714
Total	25,587,290	27,535,616	D. 1,948,325

The stock of coal on hand at tidewater shipping points Sept. 30, 1889, was 877,237 tons; on Aug. 31, 1889, 795,749 tons, an increase of 81,488 tons.

East-bound Shipments.

The shipments of East-bound freight from Chicago by all the lines for the week ending Saturday, Oct. 19, amounted to 63,755 tons, against 60,446 tons during the preceding week, an increase of 3,309 tons, and against 64,070 tons during the corresponding week of 1888, an increase of 315 tons. The proportions carried by each road were:

	W'k to Oct. 19.		W'k to Oct. 12.	
	Tons.	P. c.	Tons.	P. c.
Michigan Central	6,131	9.6	5,433	9.2
Wabash	4,353	6.8	4,731	8.0
Lake Shore & Michigan South.	11,760	18.5	10,500	17.7
Pitts., Ft. Wayne & Chicago	7,571	11.9	7,640	12.9
Chicago, St. Louis & Pitts.	8,814	13.8	8,583	14.5
Baltimore & Ohio	5,418	8.5	3,495	5.9
Chicago & Grand Trunk	7,436	11.7	8,323	14.0
New York, Chic. & St. Louis	4,362	6.8	3,386	5.7
Chicago & Atlantic	7,910	12.4	7,155	12.1
Total	63,755	100.0	59,246	100.0

Of the above shipments 2,178 tons were flour, 26,592 tons grain, 2,075 tons millstuffs, 4,747 tons cured meats, 2,364 tons lard, 9,382 tons dressed beef, 1,207 tons butter, 2,324 tons hides, 138 tons wool and 5,802 tons lumber. The three Vanderbilt lines together carried 34.9 per cent., while the two Pennsylvania lines carried 25.7 per cent.

Annual Report.

Pullman's Palace Car Co.—The income account is as follows:

Revenue.

From earnings of cars		$6,825,955
" patents		8,327
" manufacturing, rentals, dividends, interest, etc		1,469,013
		$8,303,296

Disbursements.

Operating expenses, including maintenance of upholstery and bedding, legal expenses, general taxes and insurance	$3,070,779	
Proportion of net earnings paid other interests in Sleeping Car Associations controlled and operated by this company	920,906	
Interest on debenture bonds	79,527	
Dividends on capital stock	1,795,638	
Repairs of cars in excess of mileage	84,915	
Contingency reserve	100,000	
		$6,051,765
Surplus for the year (being excess of revenue over ordinary disbursements, carried to credit of income account)		$2,251,530

The following is a summary of the general balance sheet:

Assets:

1,066 cars and equipment, including franchises	$16,736,123
Amount invested in other car associations, represented by 933 cars operated	4,955,845
Real estate, plant and fixtures	9,016,562
Lumber, materials and supplies	3,347,303
Patents	98,827
Stocks, bonds and receiver's certificates	3,167,856
Cash assets	3,460,176
	$40,782,692

Liabilities:

Capital stock		$25,000,000
Outstanding bonds		820,000
Sale of old cars		441,370
		$26,261,370
Surplus	$14,905,023	
Less depreciation actually written off	383,702	
		$16,521,321

embraced in the following accounts:

Contingency Reserve	$613,940
Depreciation	1,100,000
Income account	12,807,381

President Pullman supplemented his annual report with the following general information:

During the fiscal year the sleeping car plant and franchises of the Union Palace Car Company have been purchased, also the outstanding bonds, and substantially all the stock of the Mann and Woodruff companies. This has resulted in an addition to this company's equipment of 235 cars, which are operated under contracts covering 10,142 miles of railroad.

The joint interest of the Atchison, Topeka & Santa Fe Railroad Company, in the sleeping car plant of its system, has also been purchased by this company, including a contract with it, and its controlled lines, for the operation of sleeeping and parlor cars, for a period of 25 years.

The contract with the Union Pacific Railway Co. and its controlled lines, for sleeping and parlor cars, has been extended for a like period of time, and the Richmond & Danville, East Tennessee, Virginia & Georgia, Philadelphia & Reading, Central Railroad of New Jersey, San Antonio & Aransas Pass, Atlantic & Danville, and Jacksonville, Tampa & Key West railway companies have made with this company similar contracts for sleeping and parlor cars for the same period.

The tourist or second-class sleeping cars have also been made a feature of this company's business during the year, contracts for their operation for a period of 25 years, having been executed with the Union Pacific, Atchison, Topeka & Santa Fe and Atlantic & Pacific railroad companies, by which the entire tourist sleeping car business of these systems has been transferred to the control and management of this company.

We have also assumed the operation and management of this class of cars upon the Southern Pacific, Denver & Rio Grande, and Chicago, Rock Island & Pacific systems.

There have been built and placed in service during the year, 141 sleeping, parlor, dining and special cars, costing $17,812.73 each, or an aggregate of $2,511,596.17.

The value of manufactured product in all the car works of the company for the year was $8,652,746.89, and of other industries at Pullman, including rentals, $1,735,417.64, making a total of $10,388,164.53, against $10,823,225.18 for the previous year. The reduction is due to a temporary lull in the demand for freight cars in the spring of the present year.

The number of cars employed in the service is 1,760 standard and 239 tourist or second-class.

The number of persons carried during the year was 4,242,542. The number of miles run by cars was 144,842,618.

The total mileage of railways covered by contracts for the operation of the cars of this company is now 117,854, an increase of 11,723 miles over the previous year.